Sonoscout User Manual

Learn how to use your Sonoscout app together with your LAN-XI module.

Note: This User Manual can also be found as online help within the Sonoscout app.

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Using Sonoscout

These instructions are based on the following configuration:

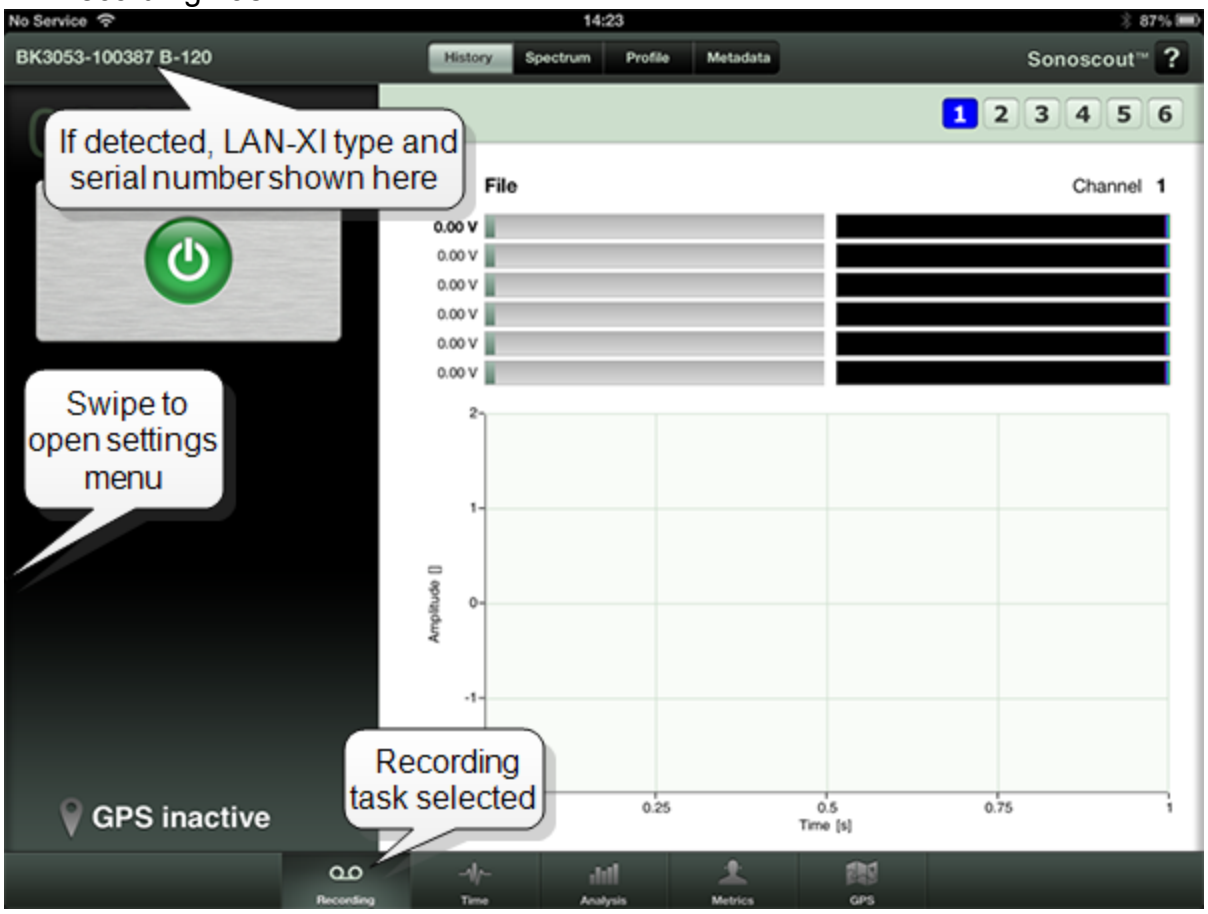
- Sonoscout app
- A single LAN-XI input module (with 4-, 6- or 12-channels)
- A LAN-XI battery module
- A LAN-XI WLAN frame
- Installed Sonoscout license

If you do not have this configuration, you can only run Sonoscout in the Virtual Front-end Mode.

Starting Sonoscout

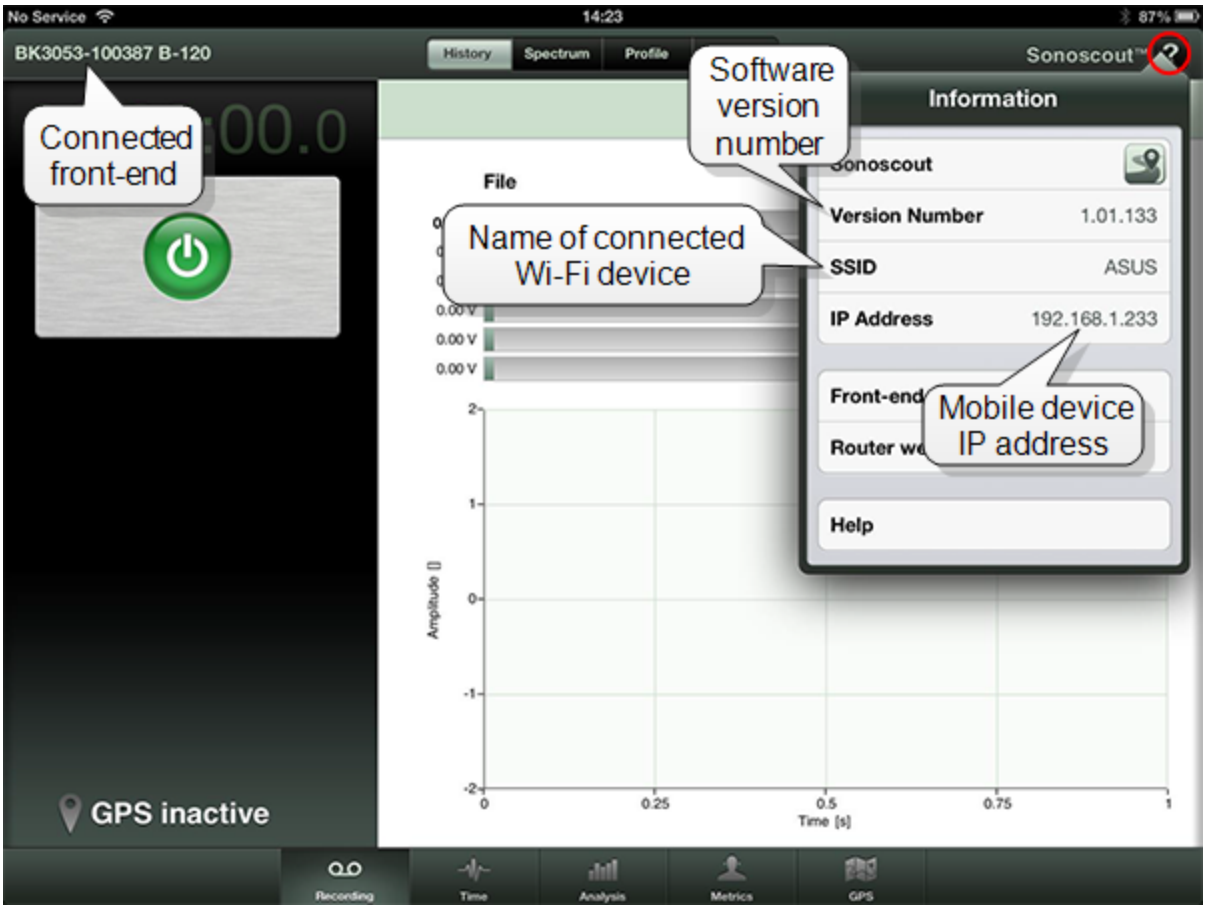
To start Sonoscout:

1. From the Home screen tap the *Sonoscout* icon. Sonoscout opens in the Recording Task:



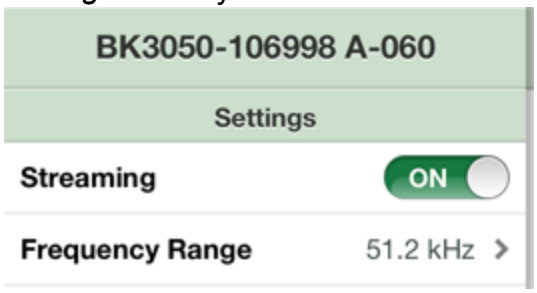
Note: If Sonoscout does not detect a LAN-XI module, a warning message replaces the LAN-XI type and serial number.

After startup, useful status information is also available in the About dialogue:

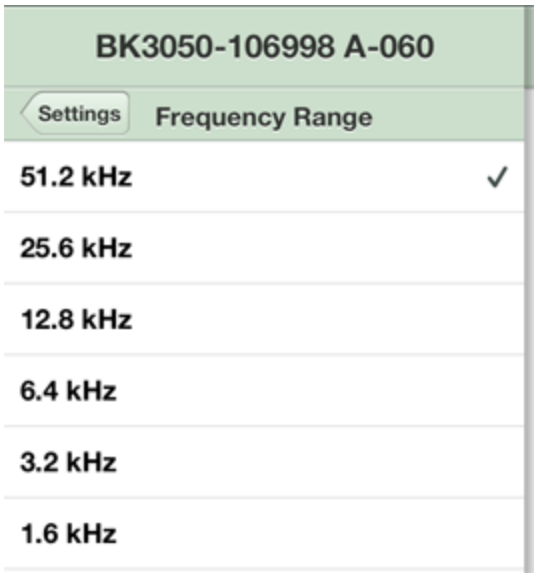

No Service
14:23
87%
BK3053-100387 B-120
History
Spectrum
Profile
Sonoscout™
Connected front-end
Software version number
Information
Sonoscout
Version Number
1.01.133
SSID
ASUS
IP Address
192.168.1.233
Name of connected Wi-Fi device
Mobile device IP address
Front-end
Router
Help
File
0.00 V
0.00 V
0.00 V
Amplitude []
Time [s]
GPS inactive
Recording
Time
Analysis
Metrics
GPS

Setting up a Recording

1. Set *Streaming* to *Off* if you want to record the time files to the SD card of the LAN-XI Module, and set *Streaming* to *On* if you want to record directly to the mobile device:



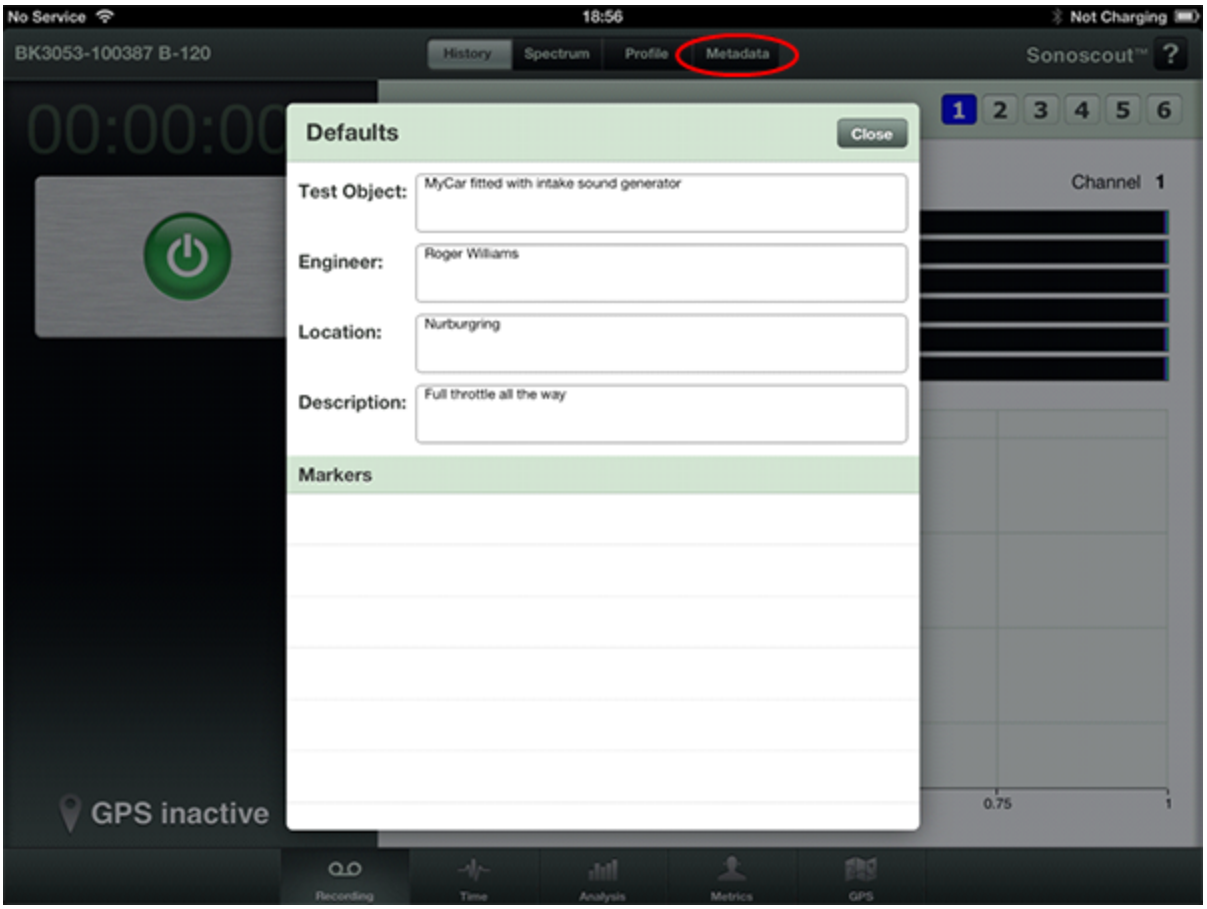
2. Set the frequency range (module dependent). Data is sampled at 2.56* this frequency:



   Tap *Settings* to return to the Settings menu, and swipe from the right side of the settings menu to the left side of the display to collapse the menu.

3. Alternatively, you can set up and/or review the complete channel table, see Setting up a Channel Manually.

4. If you tap the **Metadata** button, you can enter descriptive information before you record each test:

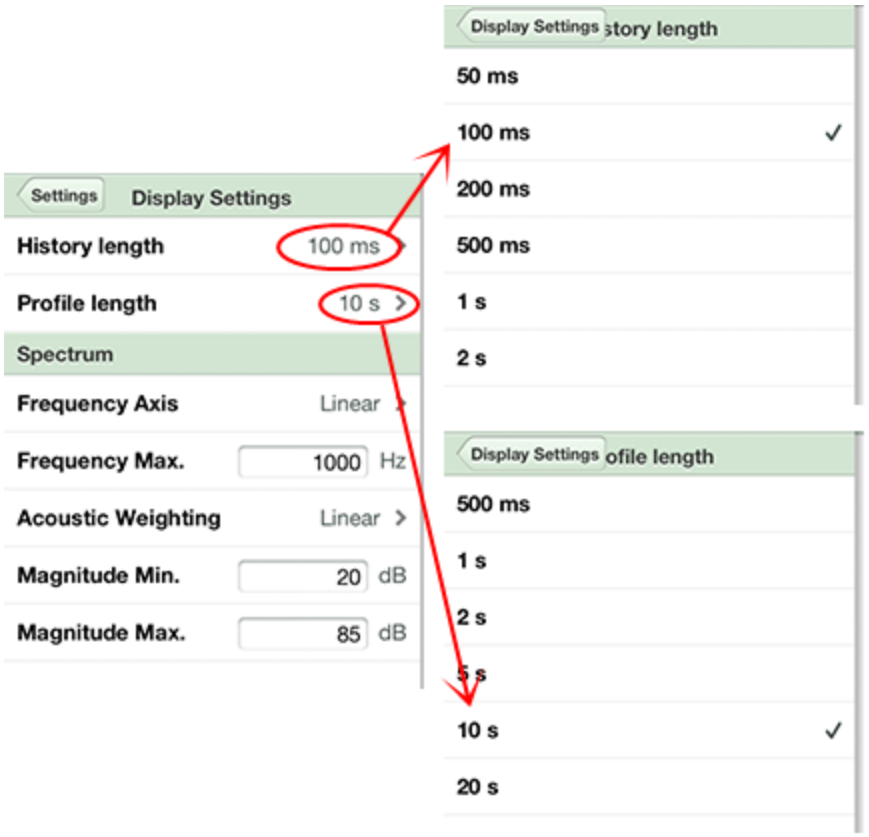


Note: This Metadata is also shown in PULSE™ Reflex.

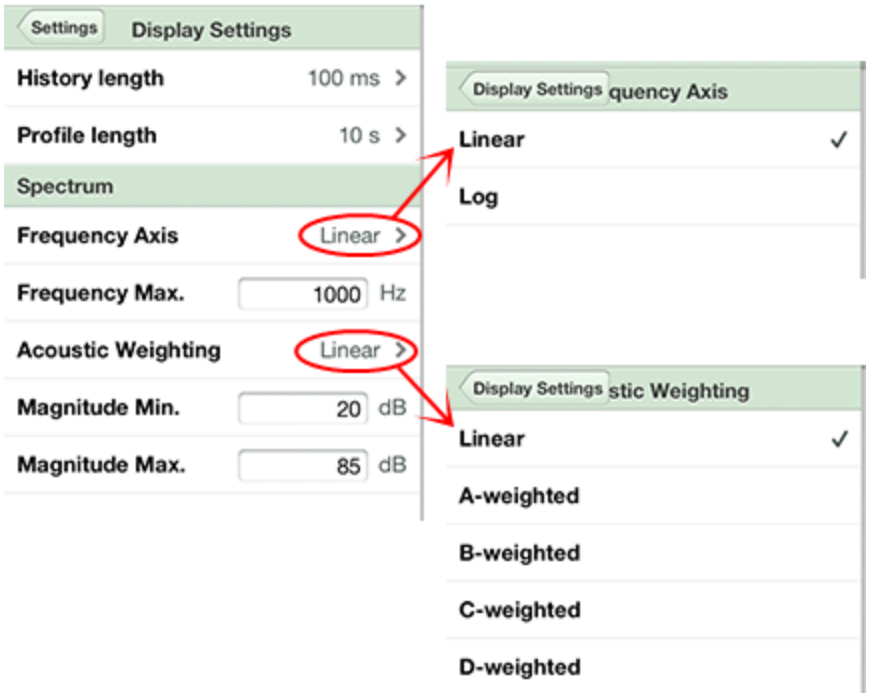
You can also edit the metadata after you have made the recording. So, for example, you could enter data in the *Test Object*, *Engineer*, and *Location* fields before you make any recordings, and enter an appropriate description immediately after each test has been recorded.

5. Tap on *Display Settings* in the Settings menu to change the various display settings, as required.

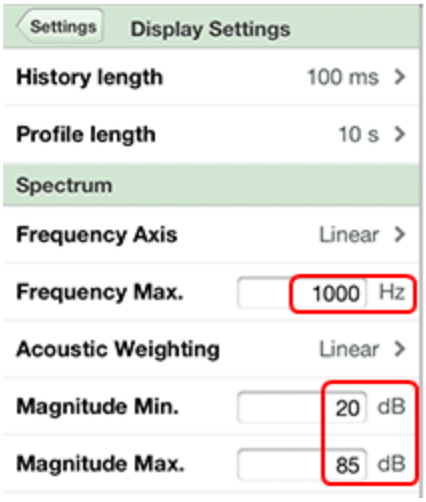
   You can set the length of the time axis for the real-time History and Profile displays by selecting them in the Settings menu:



You can choose whether you want to use a Linear or Log frequency axis for the real-time Spectrum display and whether to apply an acoustic weighting (to sound pressure channels only).

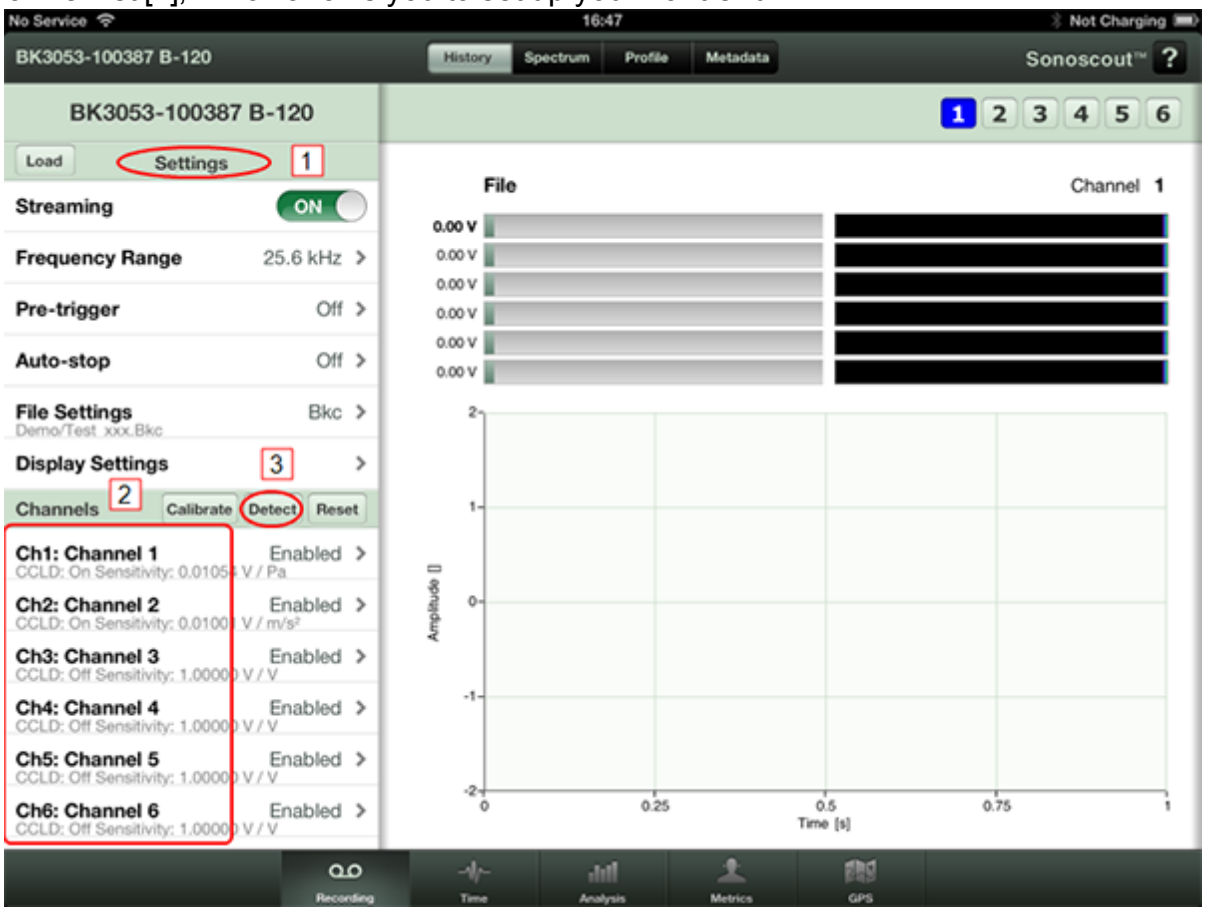


You can also specify the Magnitude and Frequency ranges for the real-time Spectrum. Sound and non-sound channels can have different magnitudes:



Setting up a Channel Manually

Open the module settings menu [1] in the Recording task. This menu also includes the channel list [2], which allows you to set up your front-end:



The type and serial number of the LAN-XI module you are using will appear at the top of the settings menu, and all channel settings will be at their default setting.
If you have TEDS transducers connected, tap **Detect** [3] and the system will automatically fill in the details. The **Detect** button flashes whilst the system is detecting.
Note: The **Reset** button does not reboot the LAN-XI module, it only resets the entries in this form by restoring them to their default settings.

TEDS Detection

When a TEDS transducer is detected. The following settings are automatically set:

- CCLD or 200 Volt Polarisation as appropriate
- Filters:
  - 7.0 Hz for accelerometers
  - 22.4 Hz for microphones
- Channel Type = Signal
- Grounded

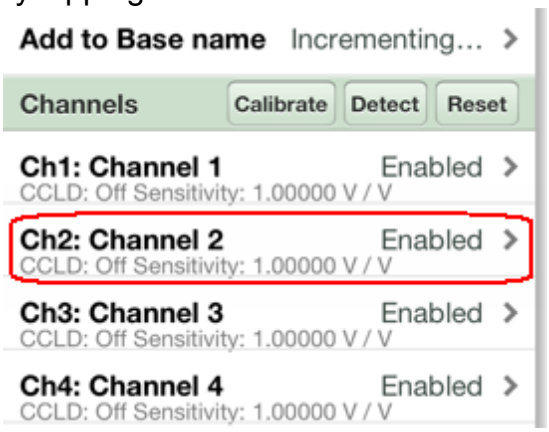
The exception is the Laser Tacho Probe Type 2981, where the following settings are used:

- CCLD
- 7.0 Hz Filter
- Grounded
- Channel Type = Tacho
    - Pulses per Rev = 1
    - Tacho Threshold = 50% Relative

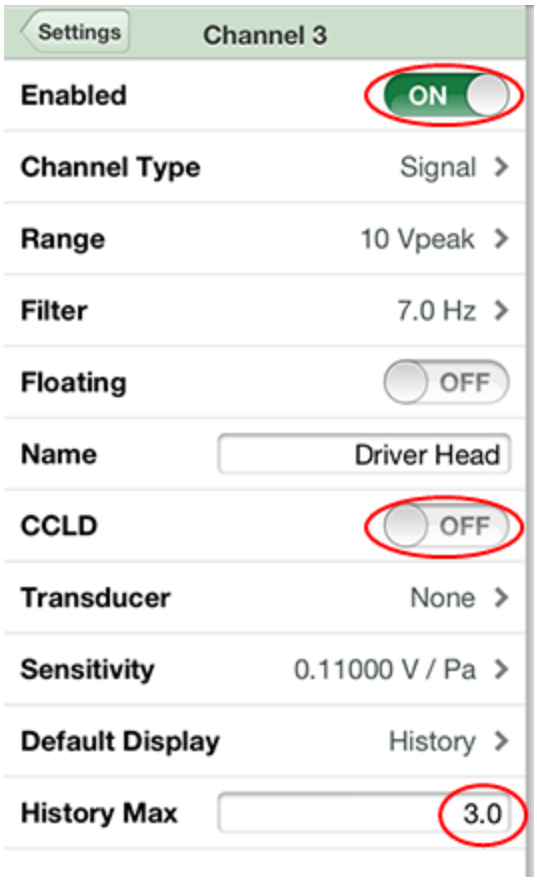
Procedure

If you are not using TEDS transducers, you can enter the values manually by selecting the channel and working through the following procedure:

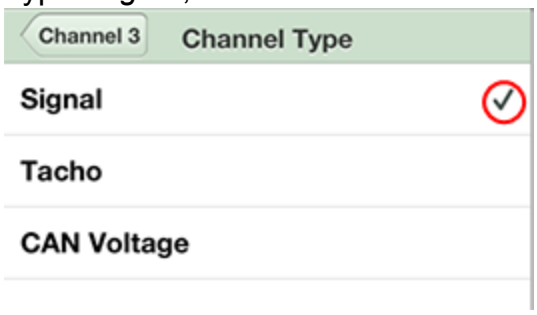
1. Select the channel by tapping the relevant channel name in the channel list:



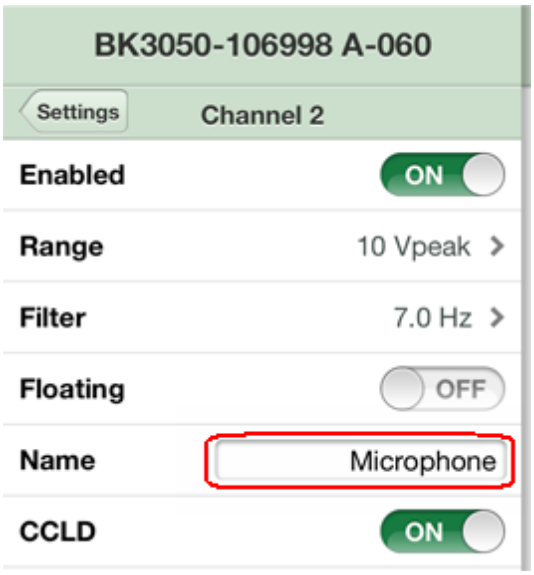
2. Enable the channel by tapping *Enabled On* and, if required, tap *CCLD On* and enter the maximum default value for the Time history display (*History Max*):



3. Choose the channel type: *Signal*, *Tacho* or *CAN*:

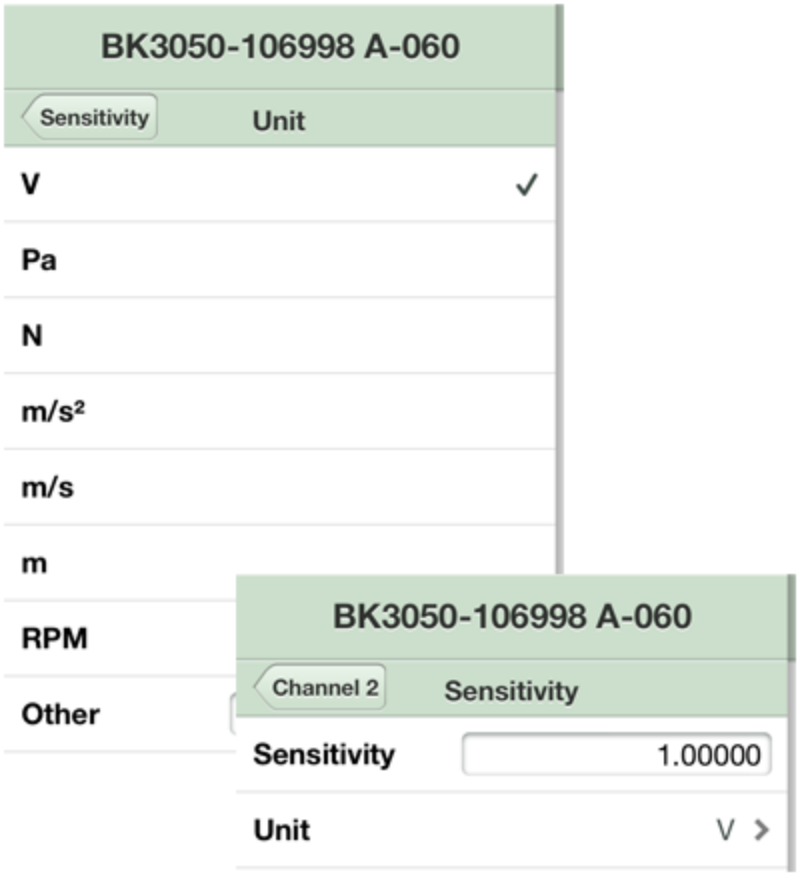


4. In the *Name* field, delete the default name and enter a new name:



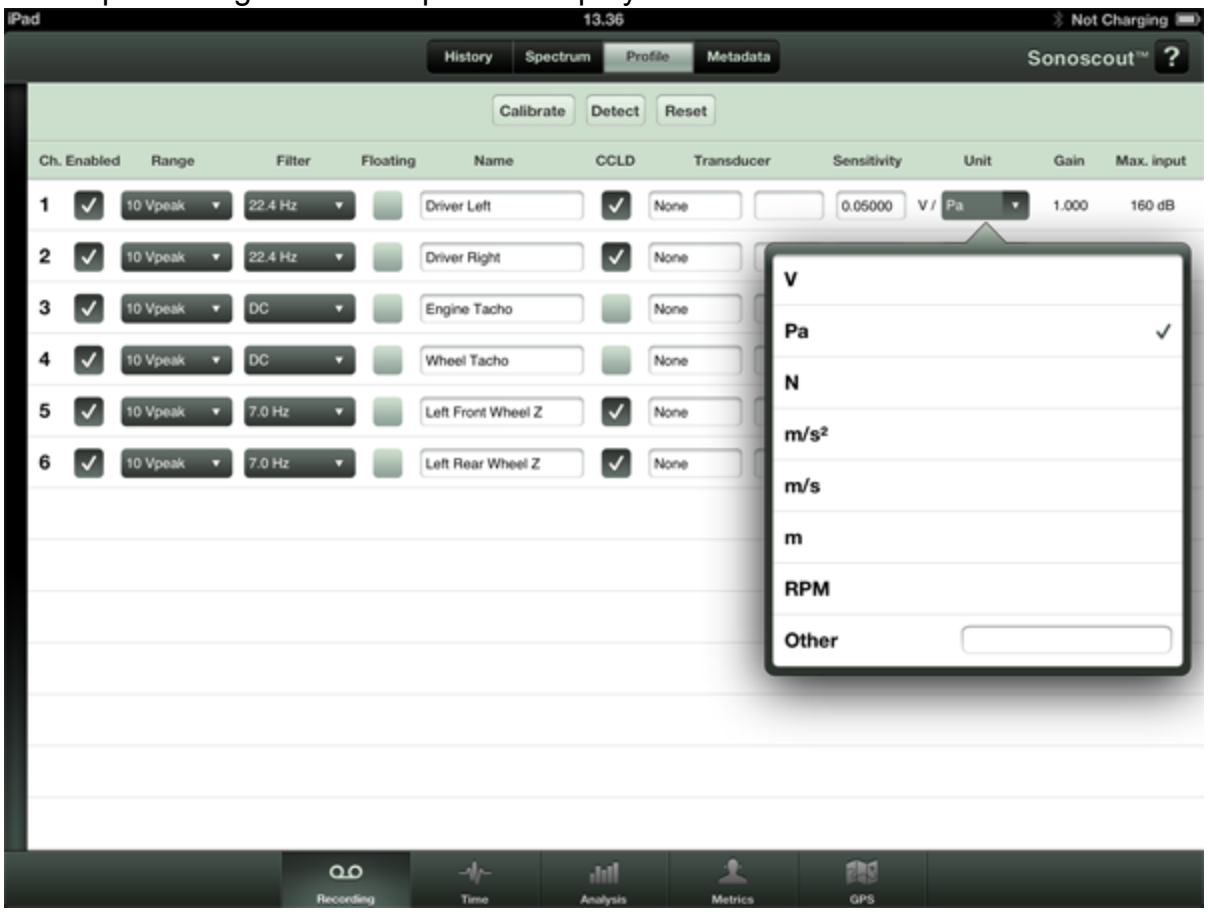
When finished tap **Done** on the keyboard.

5. In the *Sensitivity* field, enter the sensitivity value and select the unit from the list that appears when you tap *Unit*:



6. Choose the *Default Display* type, which is what the display will automatically switch to when you select the channel:

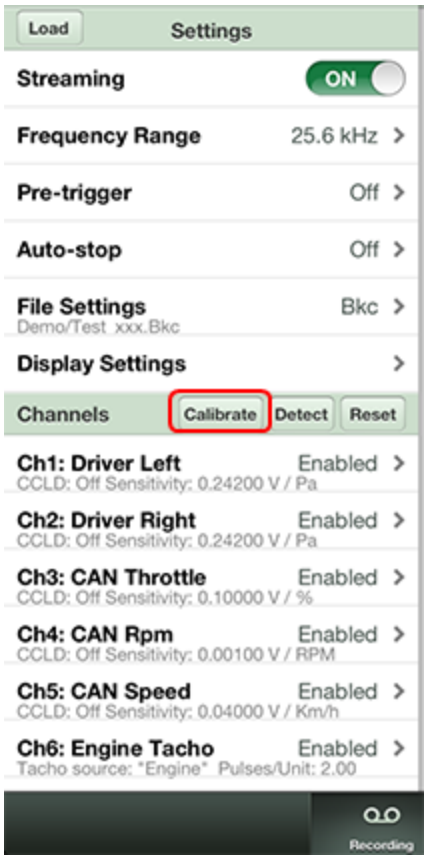
7. Alternatively, you can set up and/or review the complete channel table. To view, swipe from right to left to open the display:



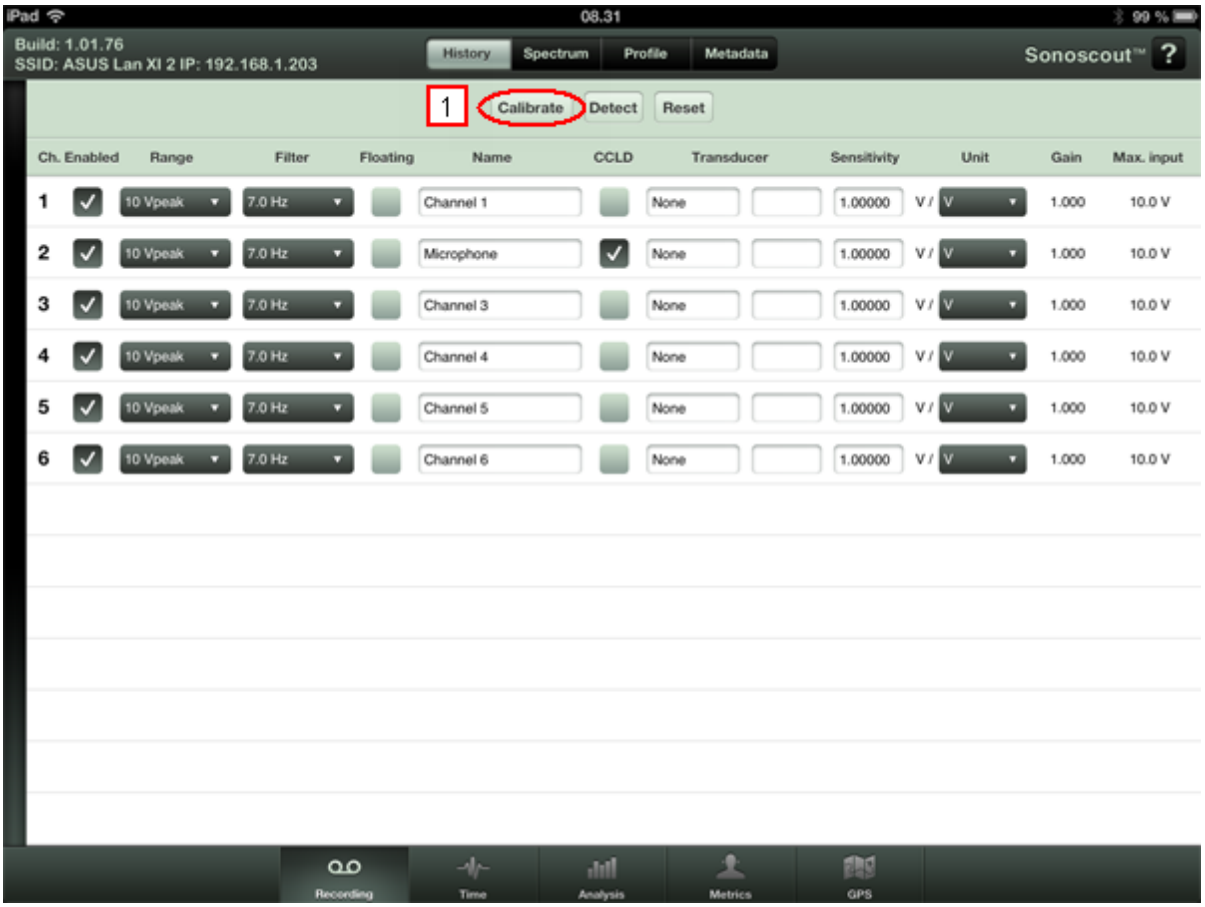
To change any of the channel settings, just tap on the relevant item in the table, for instance *Unit*, as in the example above.

Calibration

1. Swipe and open the settings menu on the left side of the display and tap **Calibrate** to start the calibration:



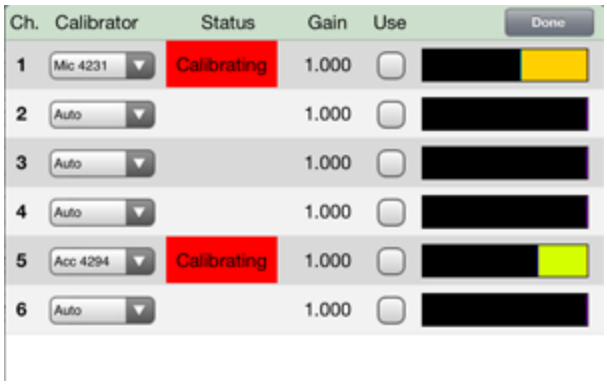
Alternatively, swipe the right side of the display to open the full width channel settings table (see below), and tap **Calibrate** [1] to start the calibration:


iPad
08.31
90 %
Build: 1.01.76
SSID: ASUS Lan XI 2 IP: 192.168.1.203
History
Spectrum
Profile
Metadata
Sonoscout™
1
Calibrate
Detect
Reset
Ch. Enabled Range Filter Floating Name CCLD Transducer Sensitivity Unit Gain Max. input
1 10 Vpeak 7.0 Hz Channel 1 None 1.00000 V / V 1.000 10.0 V
2 10 Vpeak 7.0 Hz Microphone None 1.00000 V / V 1.000 10.0 V
3 10 Vpeak 7.0 Hz Channel 3 None 1.00000 V / V 1.000 10.0 V
4 10 Vpeak 7.0 Hz Channel 4 None 1.00000 V / V 1.000 10.0 V
5 10 Vpeak 7.0 Hz Channel 5 None 1.00000 V / V 1.000 10.0 V
6 10 Vpeak 7.0 Hz Channel 6 None 1.00000 V / V 1.000 10.0 V
Recording
Time
Analysis
Metrics
GPS

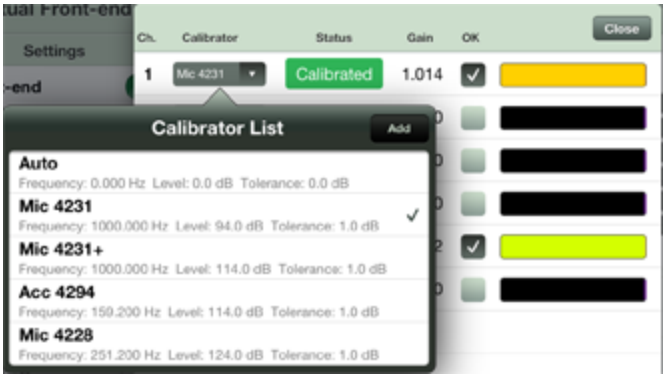
The calibration progress dialogue appears:

If all the calibrators are turned off, the dialogue is blank apart from the peak meters which start to display a 30 second peak history.
As soon as you turn on the calibrator it is detected (indicated by the yellow bar [2]) and its type number is shown on the *Calibrator* drop-down [3]:

Calibration will then begin automatically, indicated by the red bars (this takes approximately 6 seconds):



Note: The system can calibrate all channels simultaneously, if required. (The figure shows just two.)
A successful calibration is indicated by a green bar, the new Gain factor is displayed in the table and the *OK* checkbox is ticked:



If you want to re-calibrate an individual channel, uncheck the relevant *OK* checkbox and the system will automatically re-calibrate that channel.
It is also possible to add a user-defined calibrator, or edit the properties of a calibrator (e.g., to change the level from 94.0 to 94.5 dB for HATS trans-

ducers). Simply tap the down arrow next to the *Calibrator* drop-down and add calibrators (or change amplitude tolerances, etc) in the list that appears.

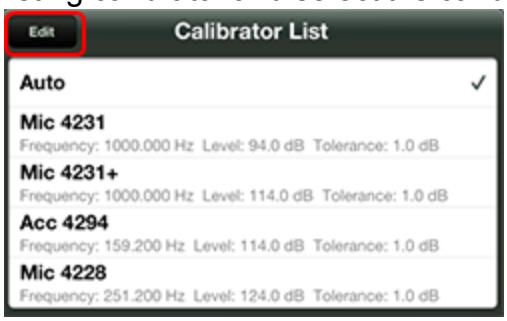
2. When all Calibration is finished, tap the **Close** button and all the checked Gain factors will replace the previous values in the channel settings table.

You are now ready to start recording, see Recording.
If you want to edit an existing calibrator, define your own Calibrator or calibrate a transducer with unknown sensitivity, click the link.

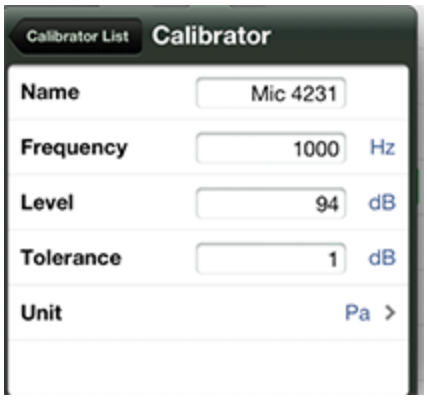
Editing an Existing Calibrator

1. From the Calibrator progress dialogue tap the **Auto** calibrator button:

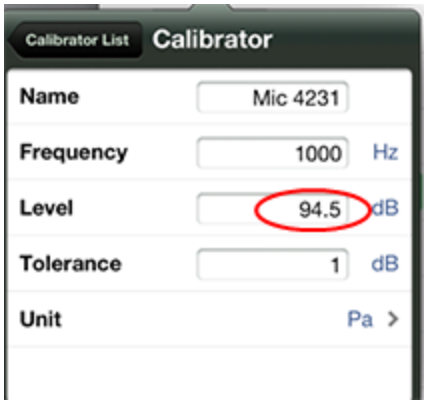
2. Tap **Edit** to edit an existing calibrator and select the calibrator you wish to modify:


Edit
Calibrator List
Auto
Mic 4231
Frequency: 1000.000 Hz Level: 94.0 dB Tolerance: 1.0 dB
Mic 4231+
Frequency: 1000.000 Hz Level: 114.0 dB Tolerance: 1.0 dB
Acc 4294
Frequency: 159.200 Hz Level: 114.0 dB Tolerance: 1.0 dB
Mic 4228
Frequency: 251.200 Hz Level: 124.0 dB Tolerance: 1.0 dB

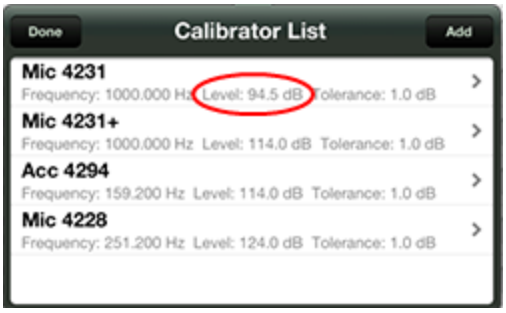
3. This opens a table of editable values:



4. Enter the changes:



5. Return to the Calibrator list and check the details have changed:

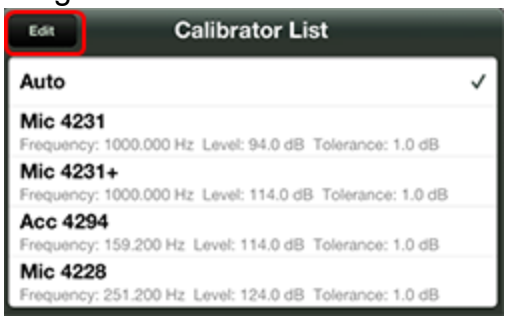

Done
Calibrator List
Add
Mic 4231
Frequency: 1000.000 Hz Level: 94.5 dB Tolerance: 1.0 dB
Mic 4231+
Frequency: 1000.000 Hz Level: 114.0 dB Tolerance: 1.0 dB
Acc 4294
Frequency: 159.200 Hz Level: 114.0 dB Tolerance: 1.0 dB
Mic 4228
Frequency: 251.200 Hz Level: 124.0 dB Tolerance: 1.0 dB

Note: The changes you make to standard calibrators are not stored permanently. They will revert back once you close the Calibration form. If you wish to keep the changes, create a custom calibrator as described below.

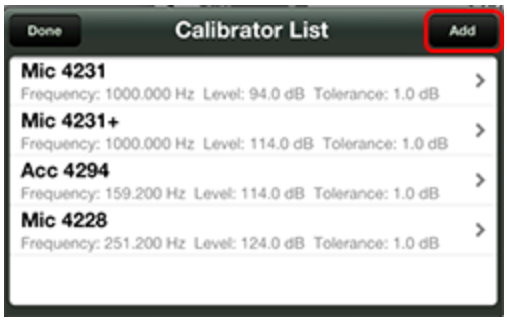
Defining Your Own Calibrator

1. From the Calibrator progress dialogue tap the **Auto** calibrator button:

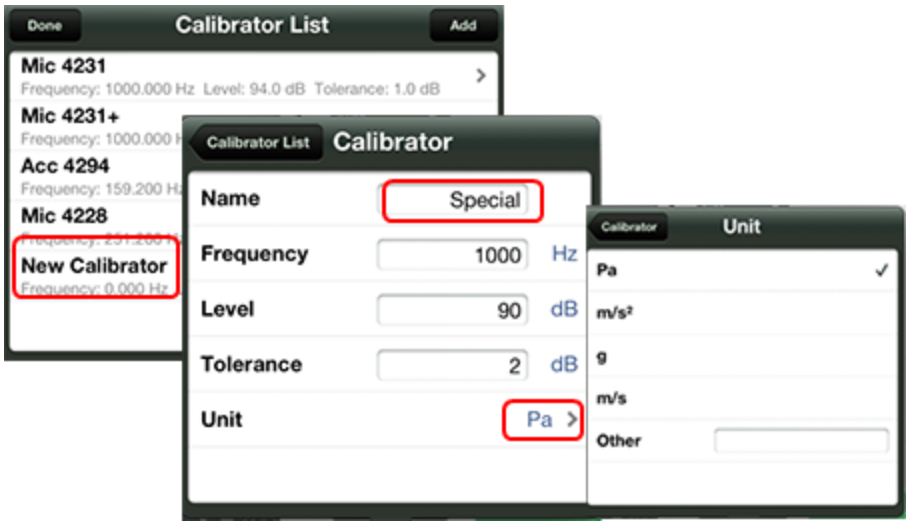
2. Tap **Edit** to enable editing of the calibrator:


Edit
Calibrator List
Auto
Mic 4231
Frequency: 1000.000 Hz Level: 94.0 dB Tolerance: 1.0 dB
Mic 4231+
Frequency: 1000.000 Hz Level: 114.0 dB Tolerance: 1.0 dB
Acc 4294
Frequency: 159.200 Hz Level: 114.0 dB Tolerance: 1.0 dB
Mic 4228
Frequency: 251.200 Hz Level: 124.0 dB Tolerance: 1.0 dB

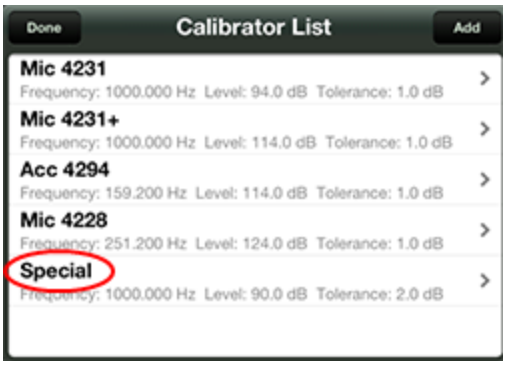
3. Tap **Add** to create a new calibrator:


Done
Calibrator List
Add
Mic 4231
Frequency: 1000.000 Hz Level: 94.0 dB Tolerance: 1.0 dB
Mic 4231+
Frequency: 1000.000 Hz Level: 114.0 dB Tolerance: 1.0 dB
Acc 4294
Frequency: 159.200 Hz Level: 114.0 dB Tolerance: 1.0 dB
Mic 4228
Frequency: 251.200 Hz Level: 124.0 dB Tolerance: 1.0 dB

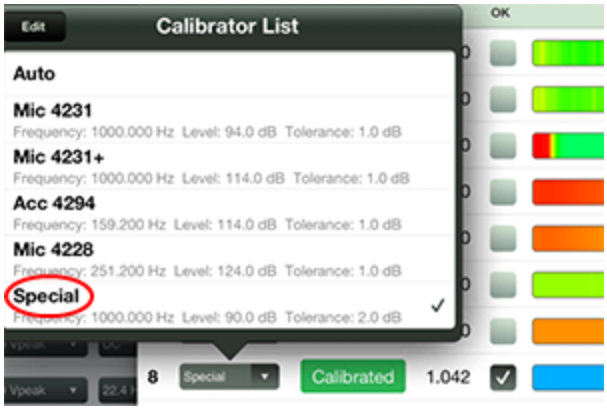
4. Select *New Calibrator* and enter the *Name* and Settings:



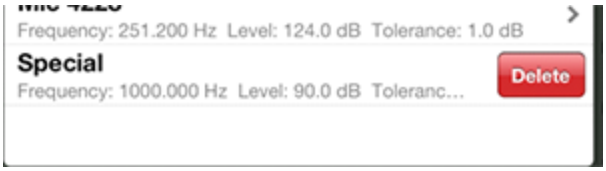
5. Return to the Calibration List where you will see the calibrator you have just created:


Done
Calibrator List
Add
Mic 4231
Frequency: 1000.000 Hz Level: 94.0 dB Tolerance: 1.0 dB
Mic 4231+
Frequency: 1000.000 Hz Level: 114.0 dB Tolerance: 1.0 dB
Acc 4294
Frequency: 159.200 Hz Level: 114.0 dB Tolerance: 1.0 dB
Mic 4228
Frequency: 251.200 Hz Level: 124.0 dB Tolerance: 1.0 dB
Special
Frequency: 1000.000 Hz Level: 90.0 dB Tolerance: 2.0 dB

6. This is saved in the *global.settings file* and will always appear in the Calibrator list in future:



7. You can delete custom calibrators (but not standard calibrators) by swiping to the left over the entry you wish to delete while in Edit mode:



Calibrating a Transducer with Unknown Sensitivity

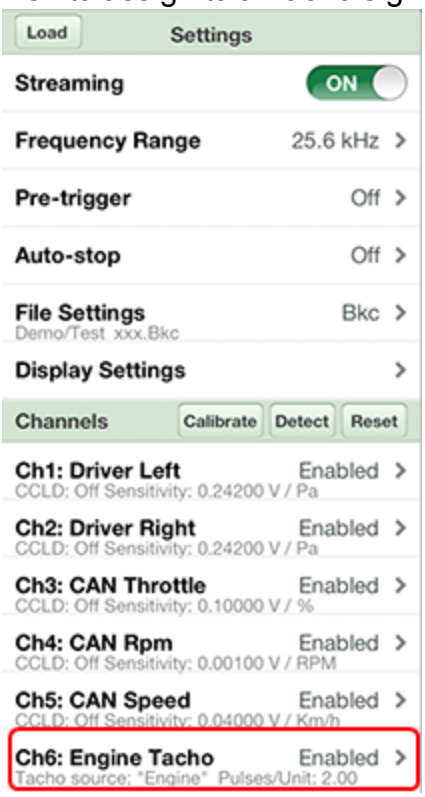
1. Manually enter the appropriate settings for the transducer in the Channel table. Remember to enter a name and serial number for the transducer and also enter '*1*' for the sensitivity, this is important:

2. Open the Calibration form and select the Calibrator you wish to use. It may Auto calibrate but if this is not what you want to do, select the preferred calibrator, uncheck the *OK* checkbox and it will repeat the calibration with the calibration settings you selected. It will calculate a Gain factor which is 1/Sensitivity:

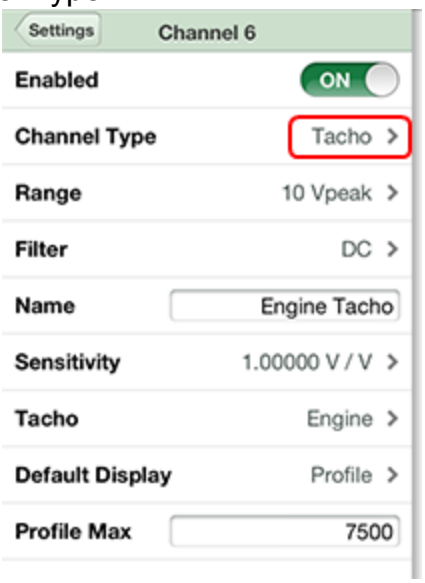
3. When you tap **Close** to close the Calibration form, 1/Gain is entered as the sensitivity in the Channel table and the information is stored in the *front-end.calib* file:

Setting up a Tachometer

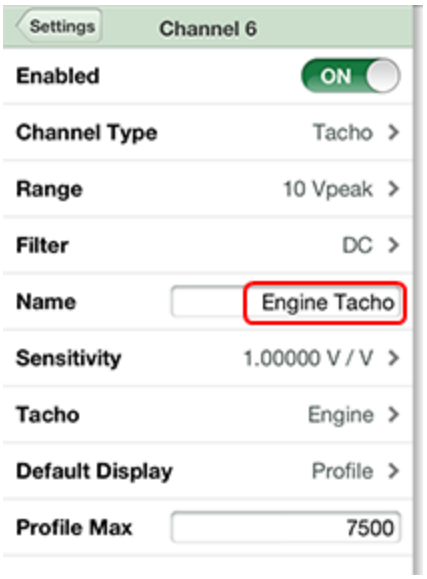
1. Select the channel you wish to assign to a Tacho signal:



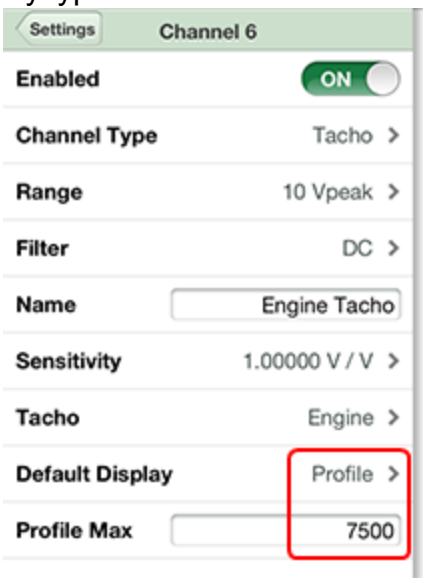
2. Select *Tacho* as Channel Type:



3. Enter a name for the Tacho channel:

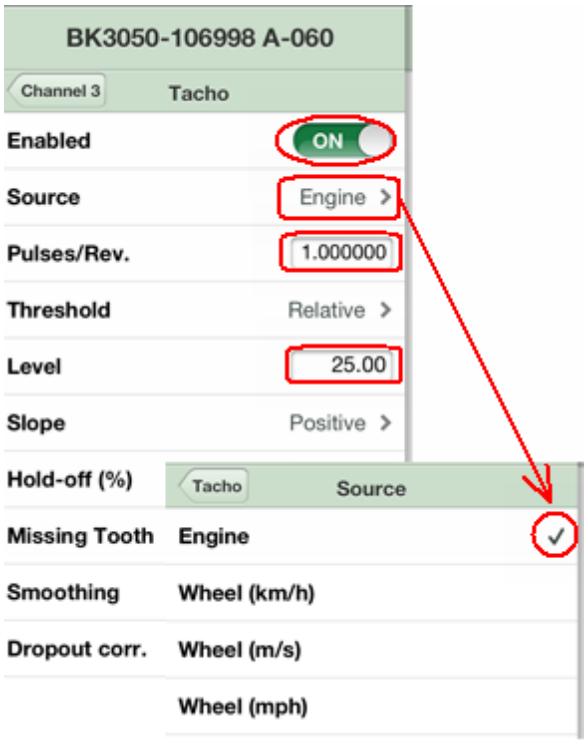


4. Choose the default display type and the maximum value for the profile display:

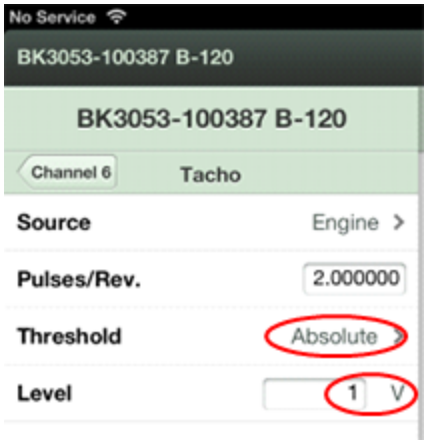


   Real-time data will be displayed from 0 to this value.

5. Select *Source* type (either engine or wheels), enter the *Pulses/Rev.* (or pulses per distance), and enter the relative trigger *Level*(in % of full range), or absolute value in Volts:



For the Absolute Threshold, enter the Threshold Level in Volts:

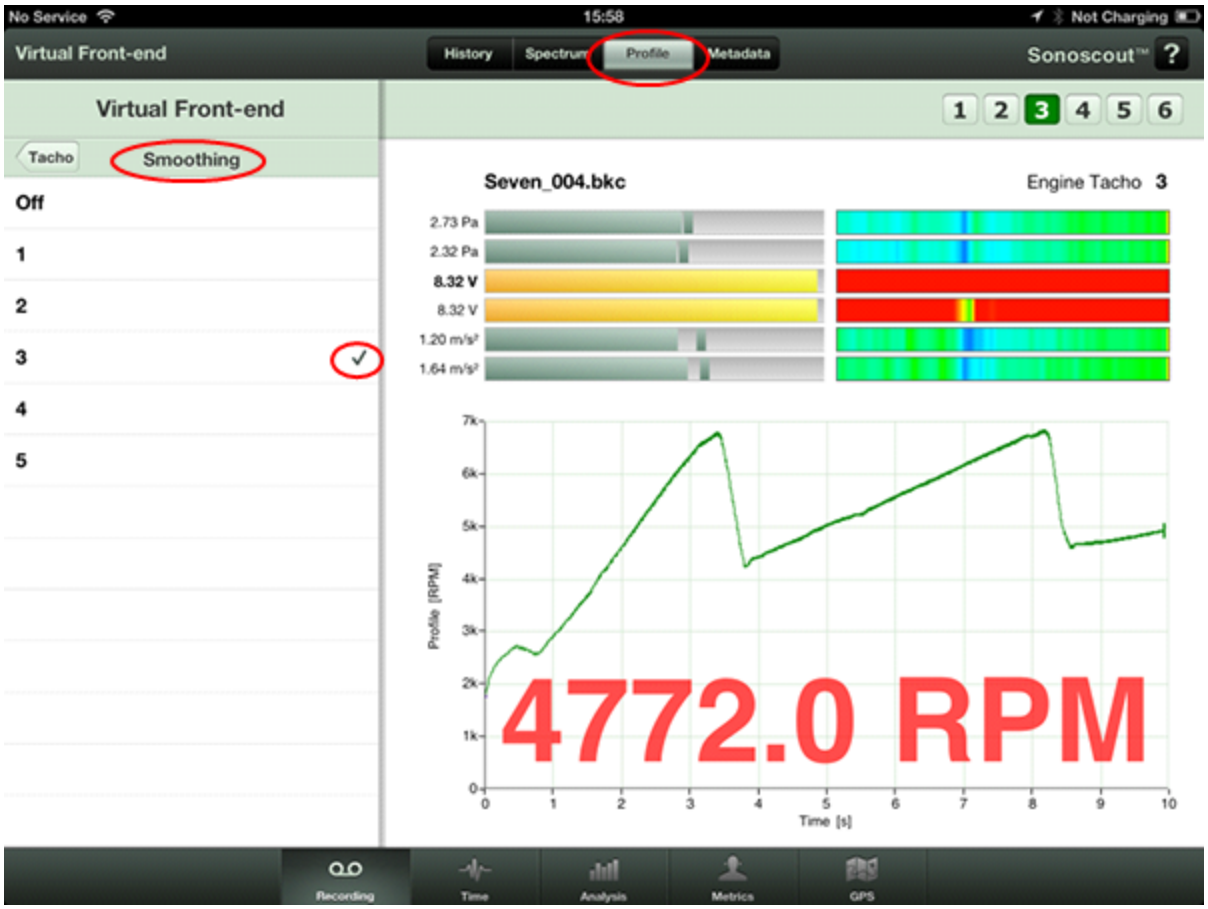


For Relative Threshold, enter the threshold level as a percentage of the difference between the maximum and minimum value of the tacho pulse.

The threshold is continuously adapting to match the incoming signal, so if you have a tacho pulse whose amplitude or mean value is continually fluctuating, the threshold line will move up and down in the real-time History display to ensure an optimal triggering.

7. When done, tap Tacho (if applicable) and **Channel X**, then Settings to return to the Settings menu. Swipe to the left to close the Settings menu.

8. If you tap the **Profile** button on a tacho channel, a large digital readout is super-imposed on the real-time profile plot. The numbers are semi-transparent so that the curve can also be seen:

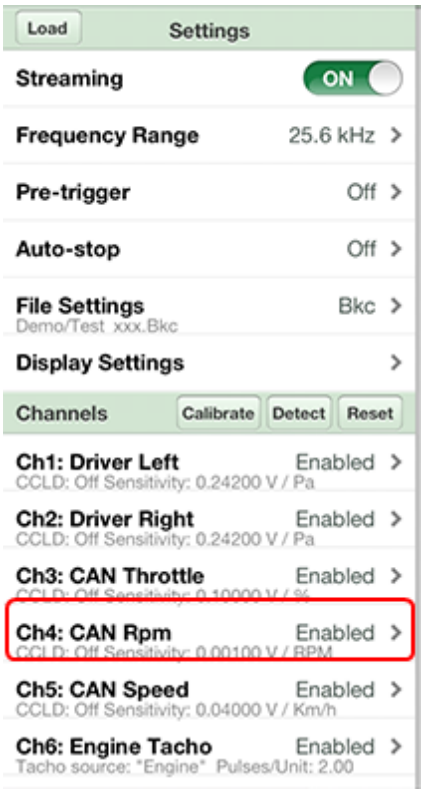


9. If you select *Smoothing* from the Settings menu (see above), the real-time tacho profiles can be smoothed using a simple linear moving average.

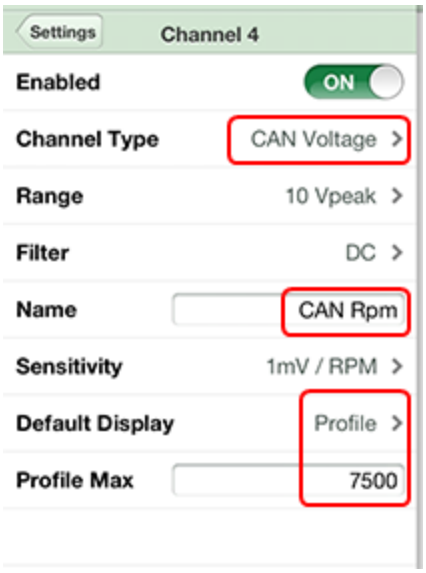
   In Pre-recording mode the Smoothing Settings menu can be left open so that you can immediately see the effect of changing the smoothing factor

Setting up a CAN Voltage Channel

1. Select the channel you wish to assign to a CAN Voltage:



2. Select *CAN Voltage* as Channel Type, enter a name for the channel, choose the default display type and enter the maximum value for the profile display:



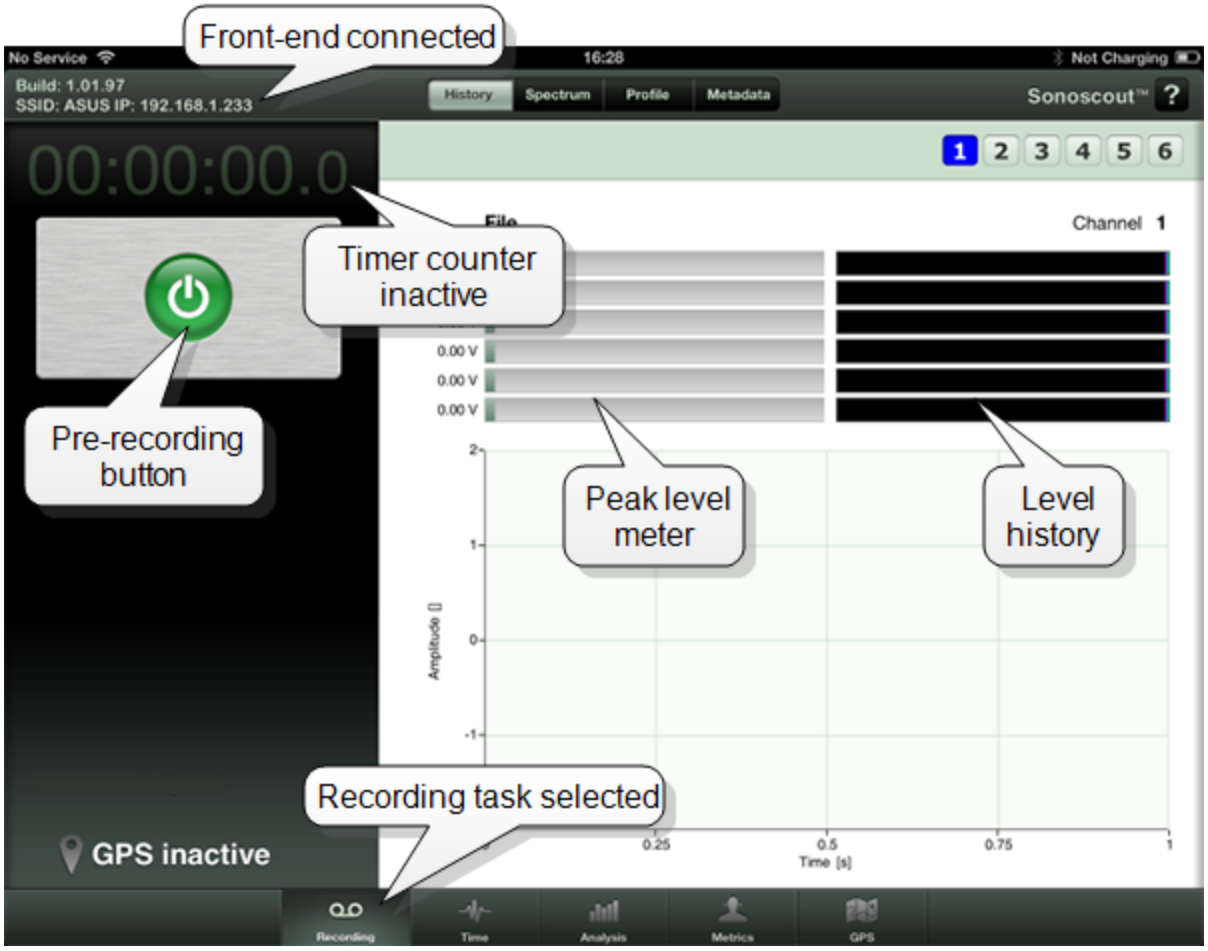
Real-time data will be displayed from 0 to the Profile Max value.

Enter the sensitivity in Volts per Unit - this calibration factor is dependent on the device you use to convert CAN messages to analogue signals. (For example, if you are using the 4-ch. CAN to Analogue Converter ZH-0700, it

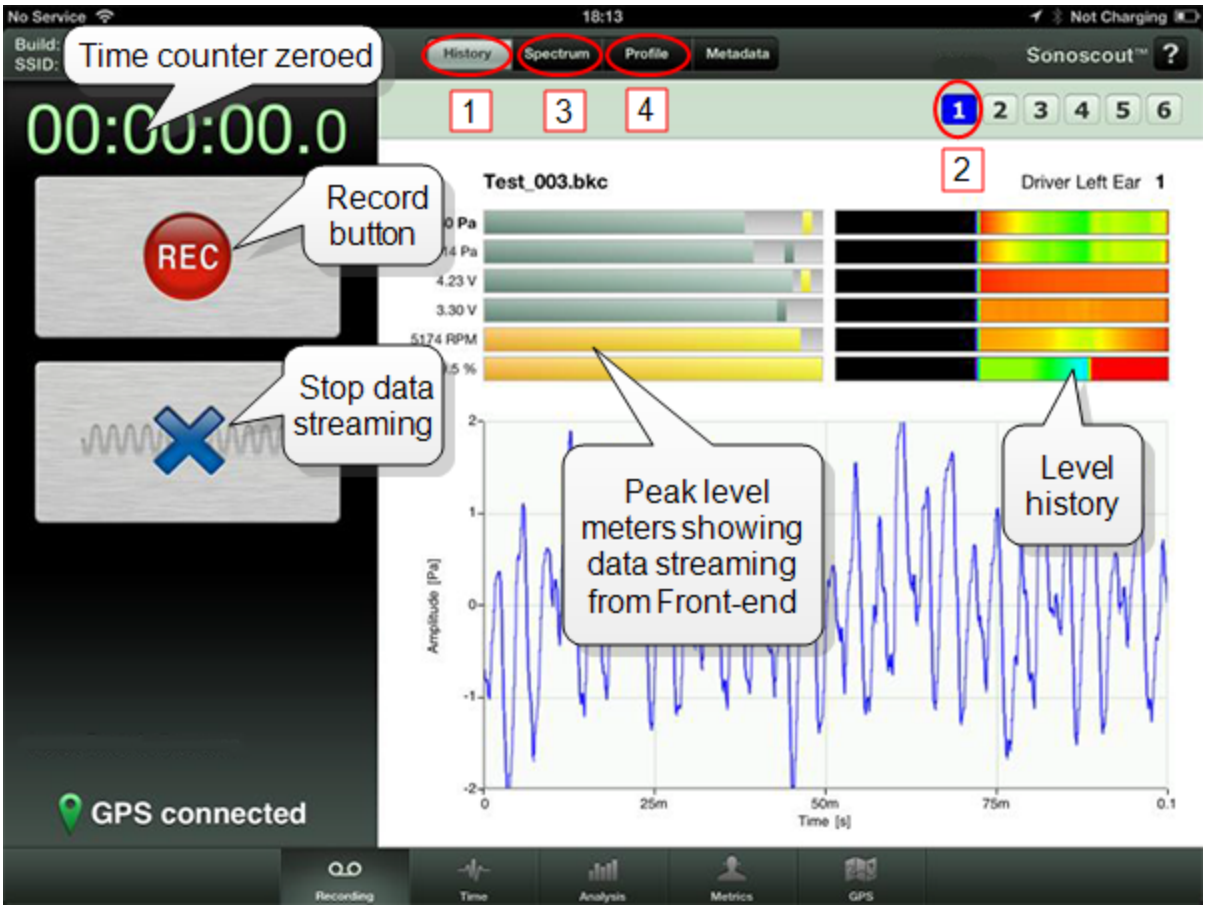
has its own calibration procedure which produces the correct sensitivity to enter in this field.)

Making a Recording

1. Make sure the Recording task is selected and the Front-end is connected:



2. Tap to enter the Pre-recording mode:



Note 1: There may be a short delay whilst the front-end is initialised.
Note 2: If you are Pre-recording (or Recording), some of the channel settings are disabled (for example, transducer specific, sampling frequencies, etc.) Display, file and threshold entries can be changed whilst pre-recording.

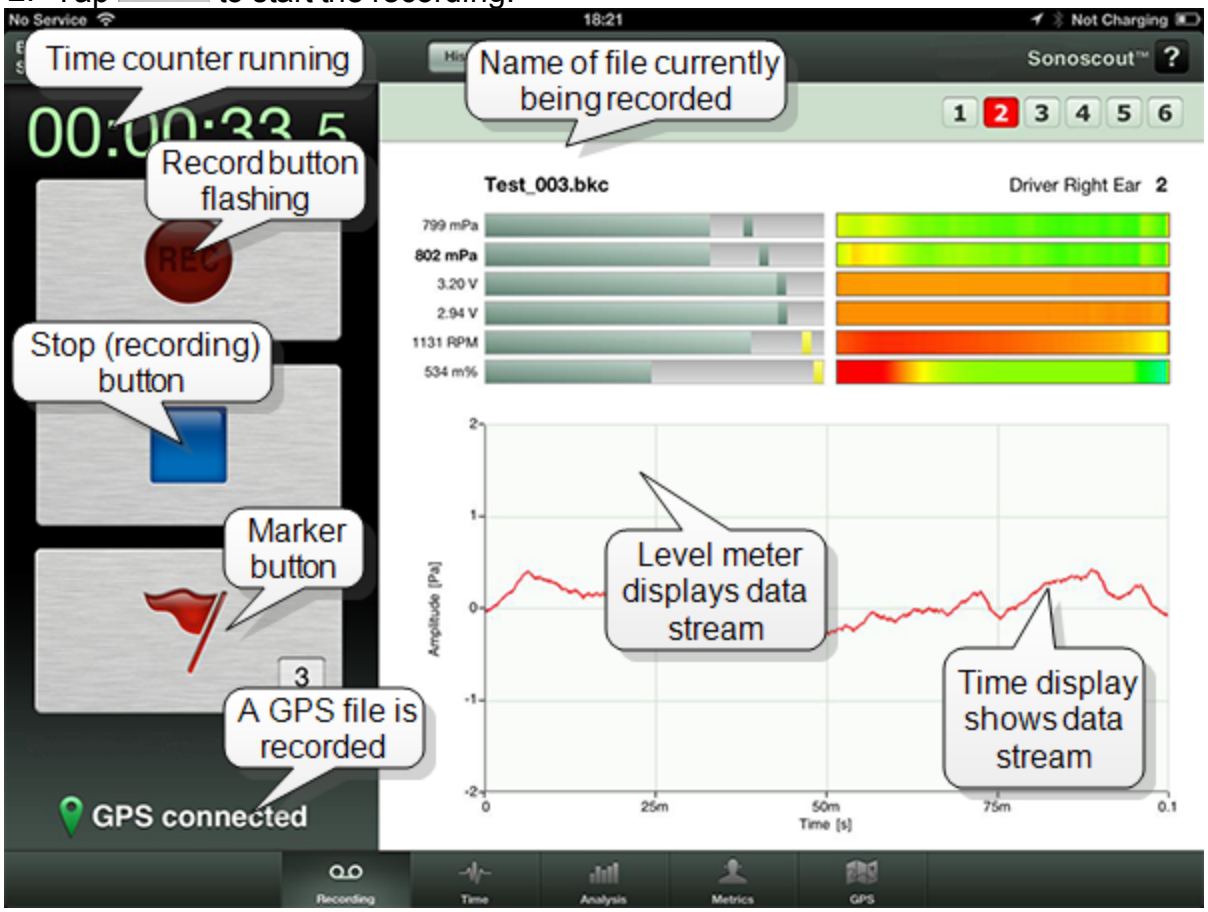
The system is now in the **Pre-recording** mode:

- The Record button appears, indicating the system is ready for recording
- The Time counter displays *00:00:00:0*
- Streaming of data from the Front-end has started and the Time display and level meters display the data
- The enabled channel connectors will be green on the LAN-XI module
- The associated peak level meters (centre) will display green bars (assuming signal levels are normal)
- The level history display starts to run

You can get a real-time display of the waveform on any channel by tapping **History** [1] and choosing the Channel Number [2].
For a real-time spectrum of any channel, tap **Spectrum** [3], for a real-time profile of any channel, tap **Profile** [4].

Tap to cancel Pre-recording.

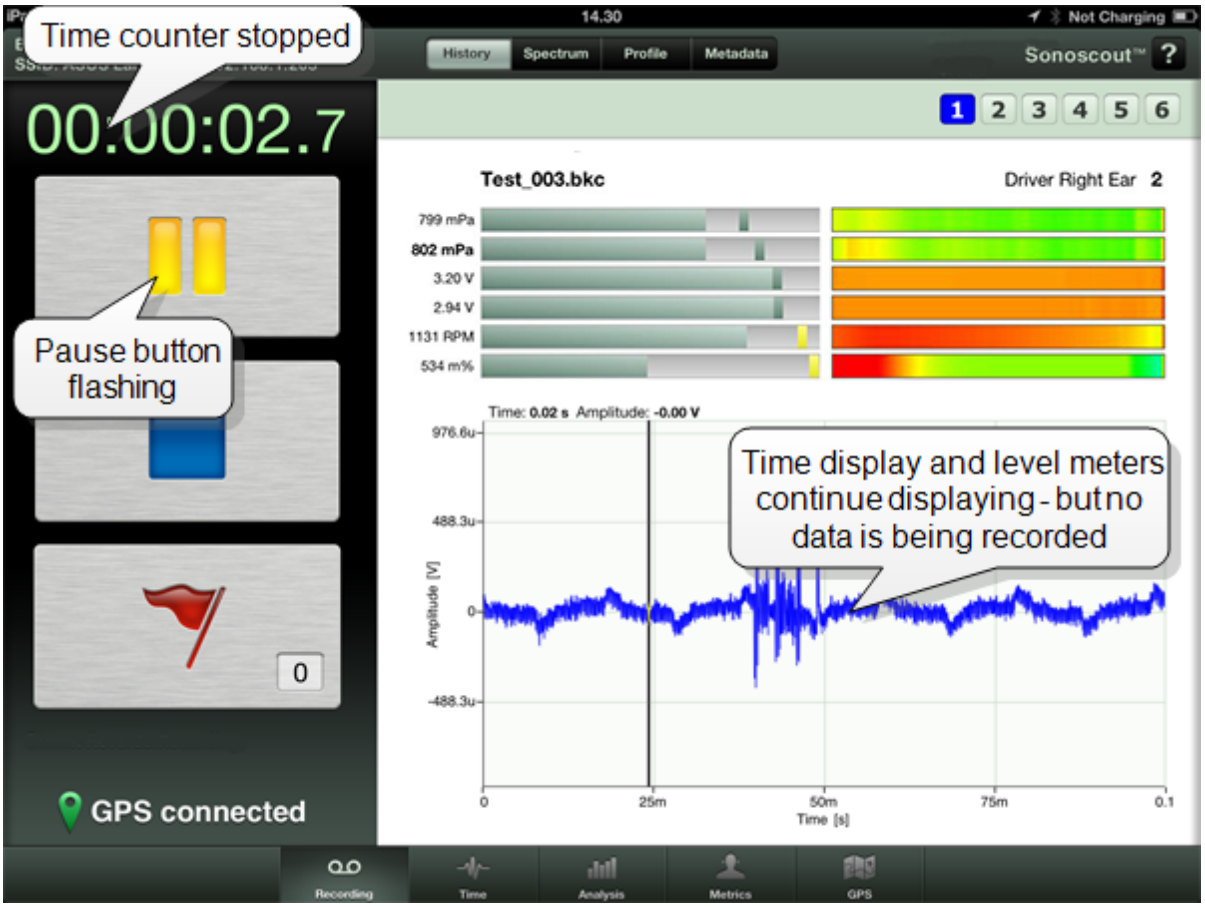
2. Tap to start the recording:



The system is is now in the **Recording** mode:

- The Record button is flashing, the enabled channels are being recorded and the time counter is running.
- The Mark Event button appears. Use this button to add markers to the file to identify important events
- A GPS file is also recorded, update rate approximately 1 Hz

3. Tap to pause the recording (if required):

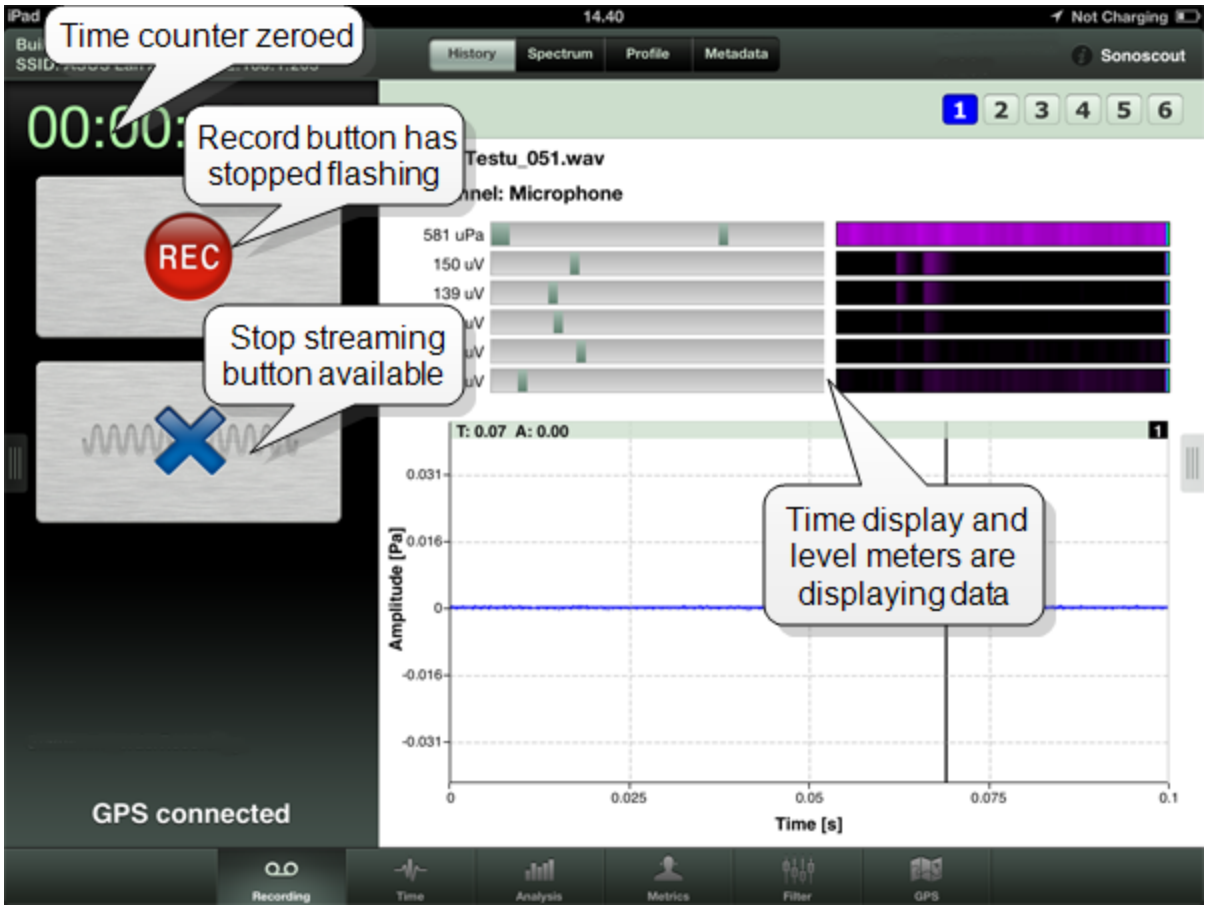


The system is now in the **Recording Paused** mode:

- The Pause button appears and is flashing
- The time counter stops at the elapsed time
- The Front-end continues streaming data (as displayed on the Time display and level meters), but nothing is being recorded
- Tap the flashing Pause button to continue with the recording, or tap the Stop (Recording) button to stop it

Note: If you continue with the recording, the data will be appended to the same file.

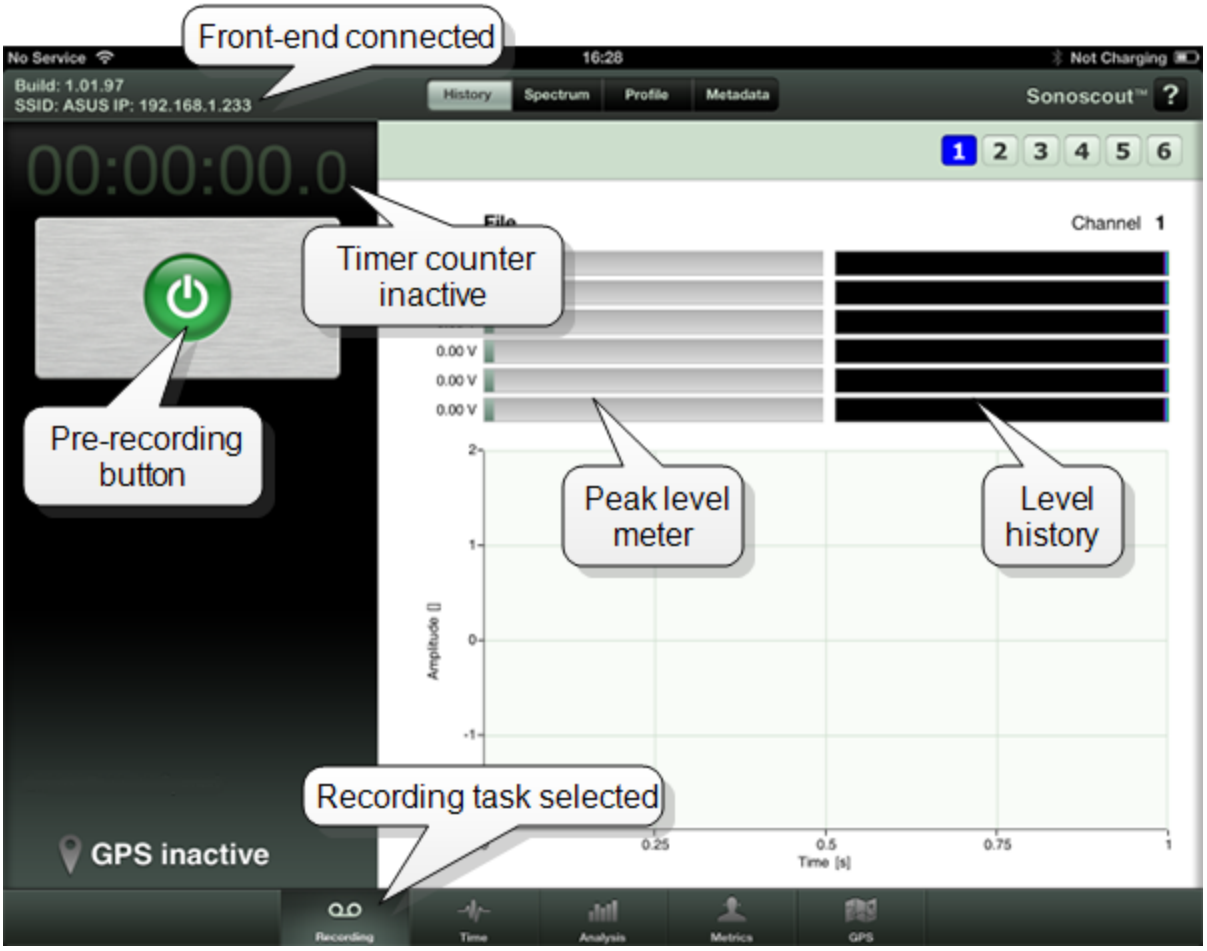
4. Tap to stop the recording:



The system reverts to the **Pre-recording** mode:

- The Record button has stopped flashing (indicating that recording is ready to start again)
- The time counter displays *00:00:00:0*
- Time display and level meters are displaying the data stream and recorder file is being stored

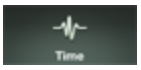
5. Tap the Stop data streaming button to stop streaming from the Front-end and return to the 'Standby' state:



The system is now back in the '**Standby**' mode:

- There is no streaming of data from the Front-end
- The 'Pre-recording' button is available
- The time counter is (greyed-out) and inactive
- To perform another recording, repeat steps 1 - 5

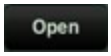
Note 1: The maximum file size you can record is 1.9 GB. The recording automatically stops once the limit is reached and a warning message appears.
Note 2: Recording automatically stops once there is less than 1.5 GB of free space on the mobile device.

Reviewing Time Data 

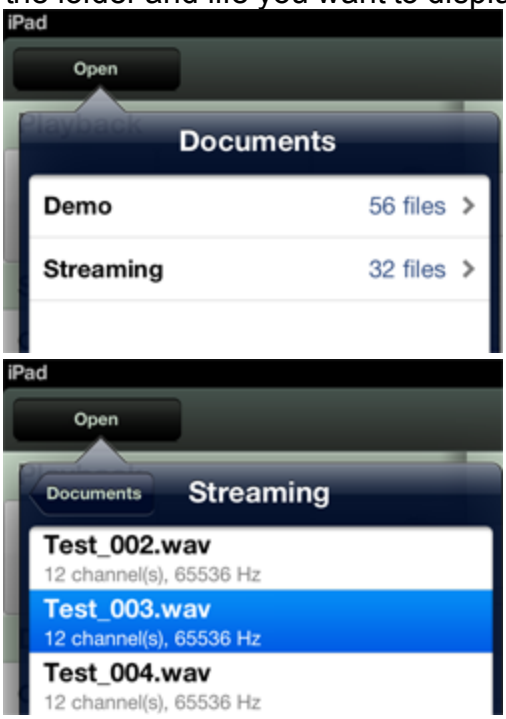
Overview

The Time task allows you to visually check all the channels in a time history, display the tacho and CAN profiles and listen to any channel (or pairs of channels) as stereo sound.

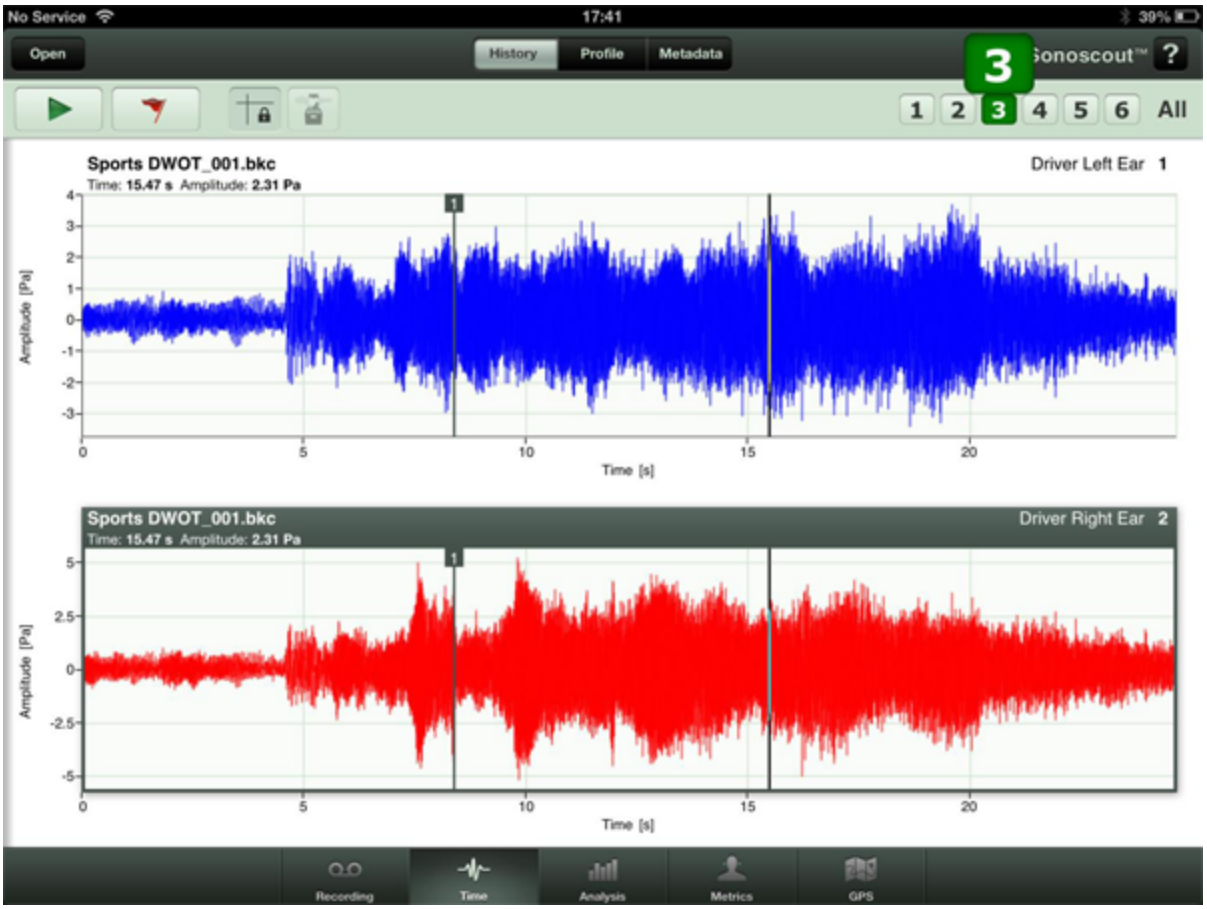
Loading a File

1. Tap 

to select the folder and file you want to display:



2. Tap the file name to open the file:

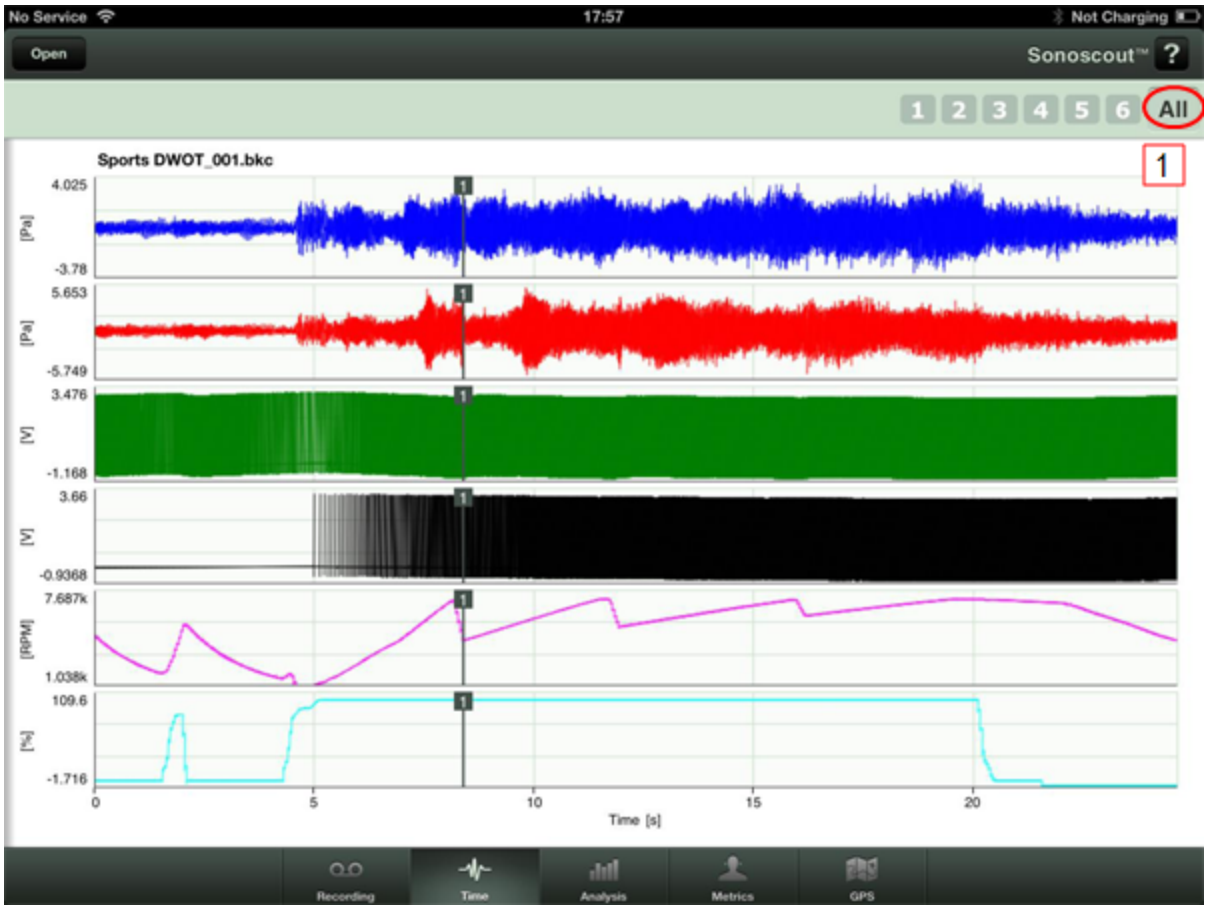


Changing Channels

Slide your finger along the channel buttons (see below). You will see a large number displayed above the button which indicates which channel will be selected if you remove your finger.

Displaying All Channels

1. Tap the **All** button [1] to toggle between displaying all channels and displaying two channels:



The purpose of this display is to perform a quick visual check that there are no obvious problems with a channel (for example, intermittent behaviour or dropouts, etc).

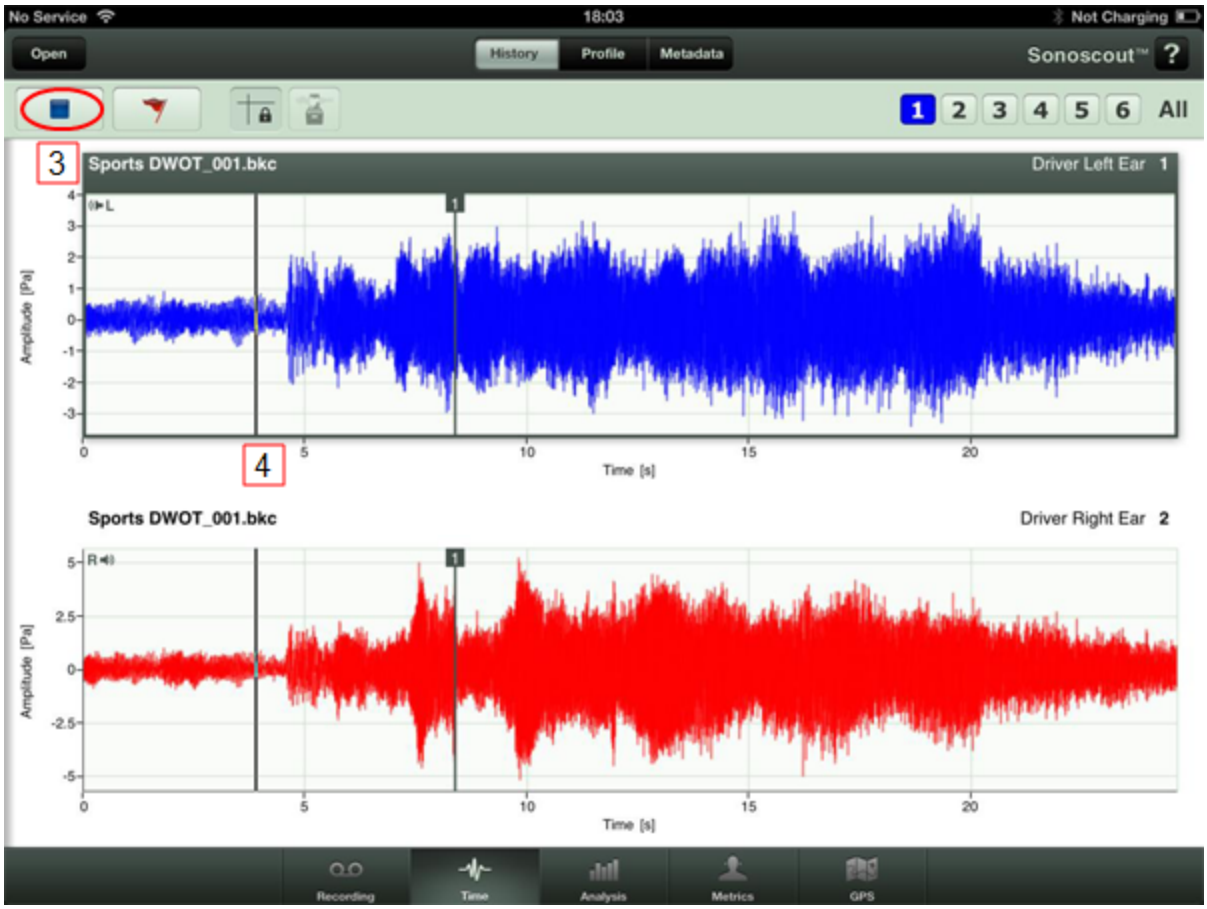
Displaying Profiles

1. Tap the **Profile** button [2], both displays switch to profiles:

A profile channel can either be a Tacho pulse or a CAN Voltage and any channels containing tacho signals are converted to profiles using the settings in the metadata.
The channel selection buttons for all non-profile channels are greyed out.

Playing a File (or Selecting Part of a File to Play)

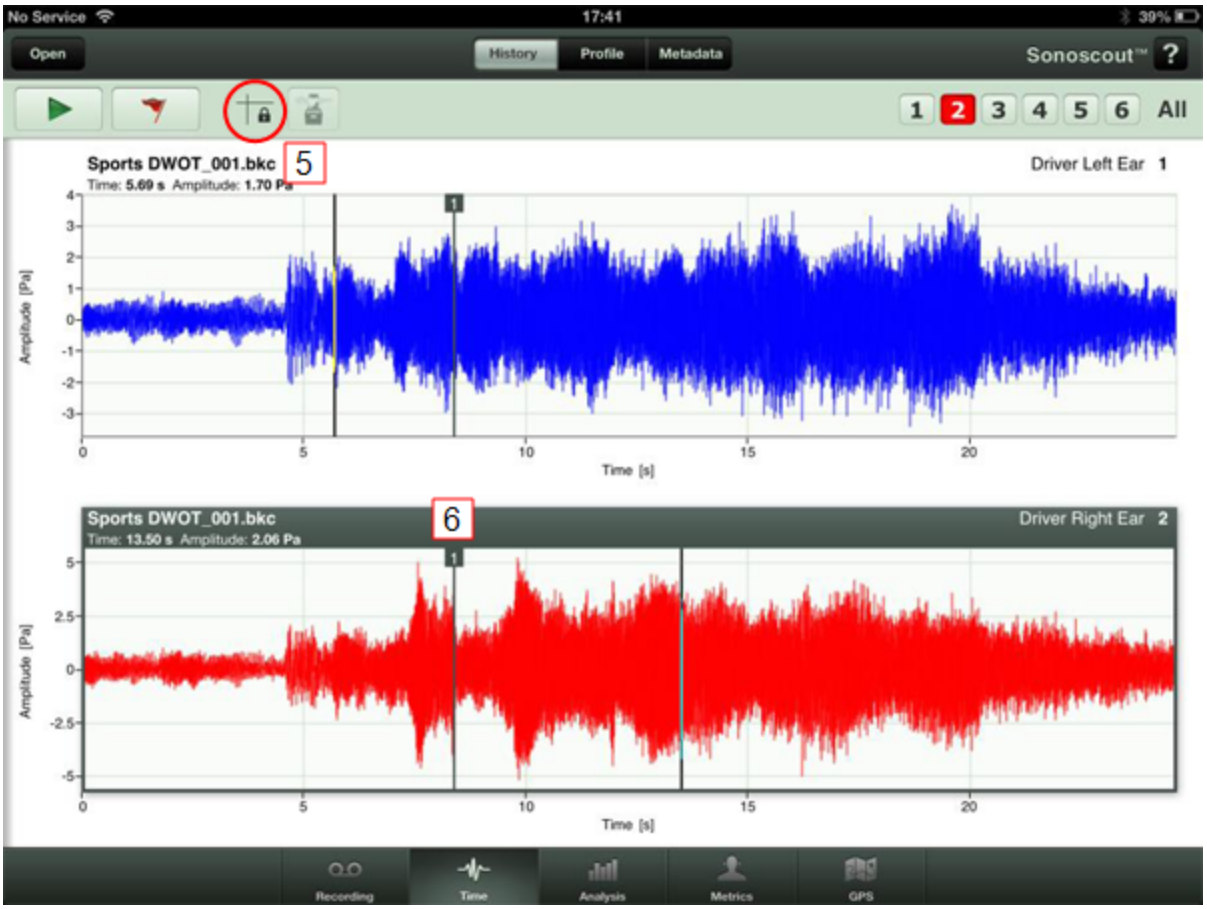
1. Tap the Play/Stop button [3] to control the replay.



The Play Cursor [4] shows which point in time you are currently hearing and it is synchronised in both windows. If no range has been selected it plays the whole sound and loops when it gets to the end of the file.

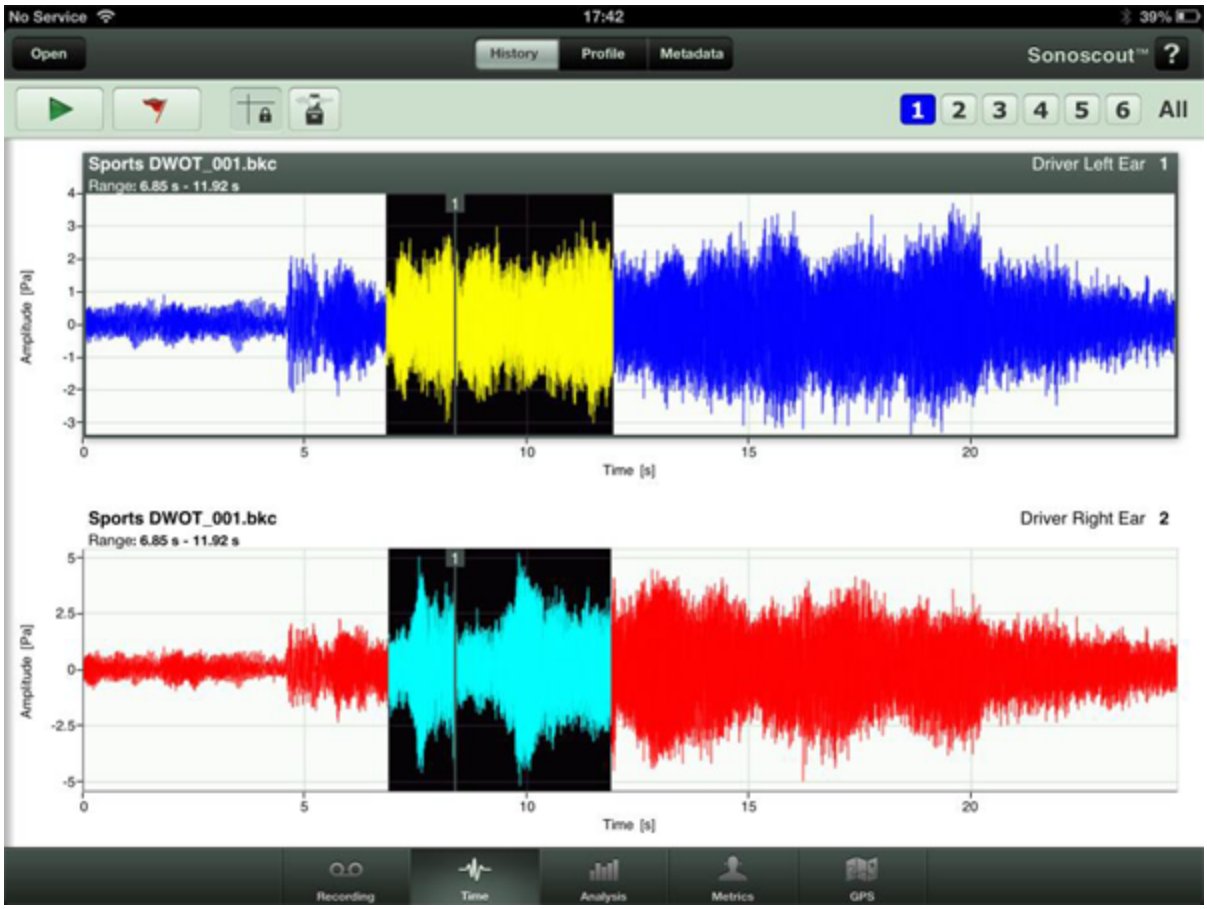
You can start playing from any point by tapping in either display to place the cursor there.

If the **Cursor Synchronisation** button [5] is off (unlocked), you can place the cursor (or drag a range) independently in each display.



The cursor position in the active (highlighted) window [6] will determine where sound replay starts. If is on (locked), the cursor and range selection is synchronised in both displays.

2. Select a range to play by touching the start point and then touching and holding your finger down on the end point in the top display:



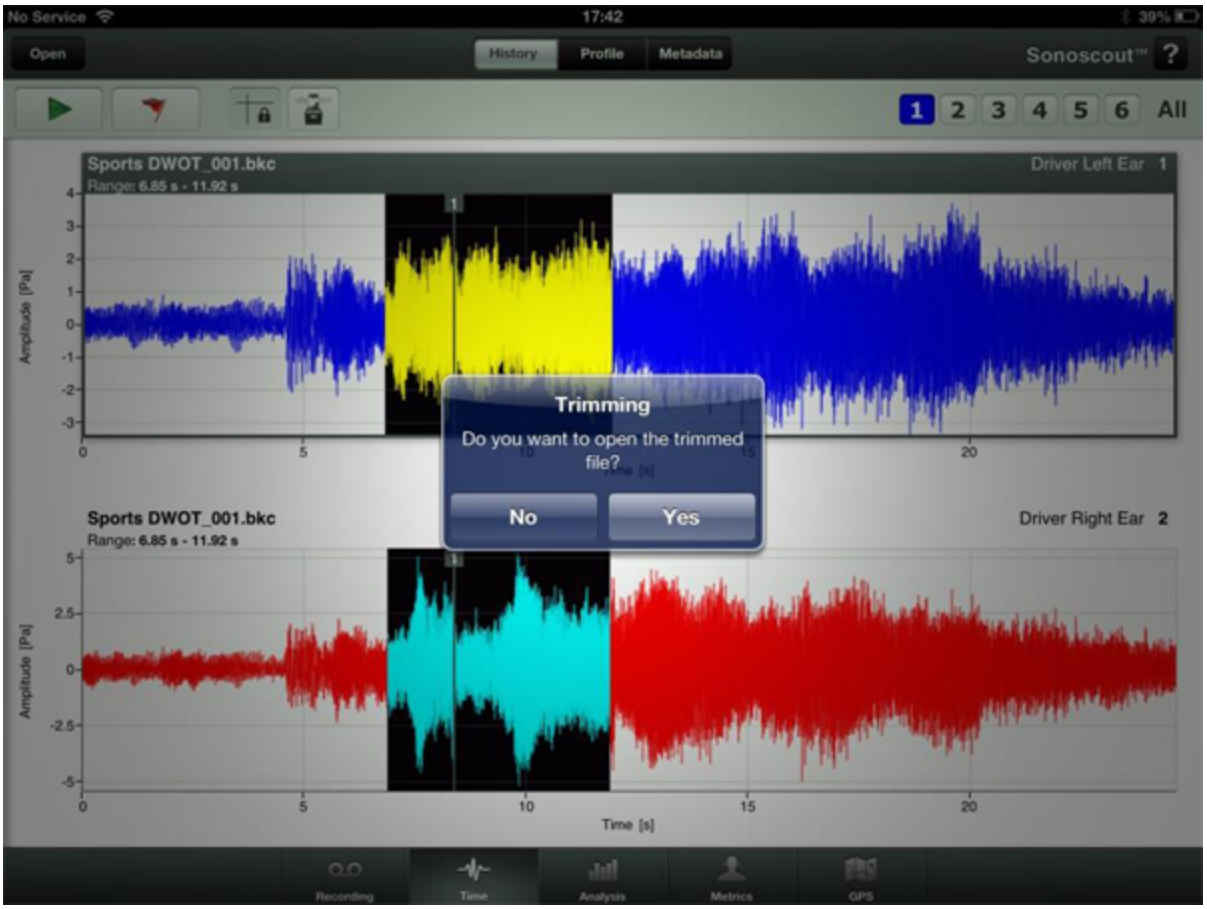
You can extend the range in either direction by touching then holding your finger at the new start/ end point. You can also enter the start and end times for the range in the settings menu.

3. With a range selected, tap to play the range, looped with cross-fading at the ends.

Trimming

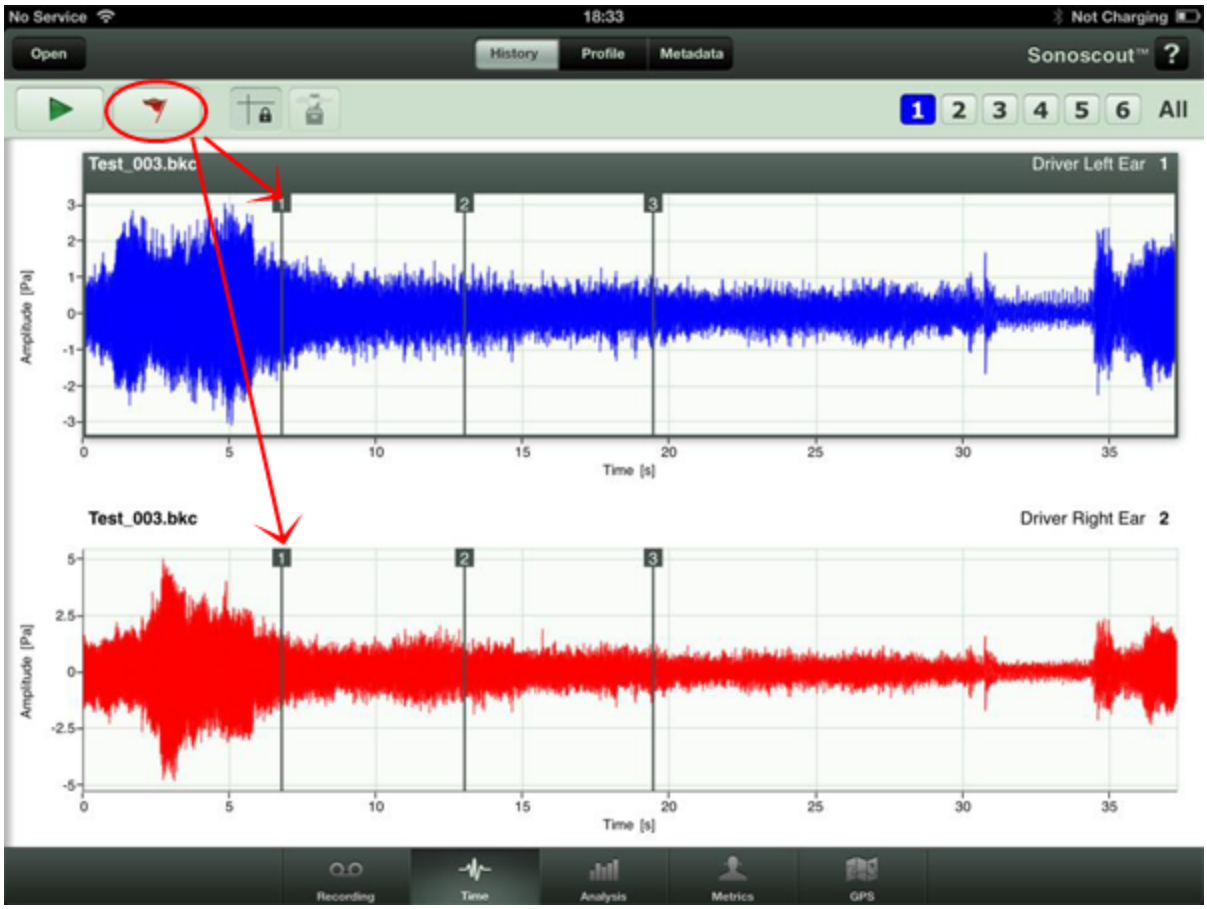
1. Use the **Trim** button to trim the file to the selected range.

   A new file is saved to the folder containing the source file. It has the same file name as the original file with the trim range appended to it. A pop-up allows you to choose whether you want to open the trimmed file, or not:

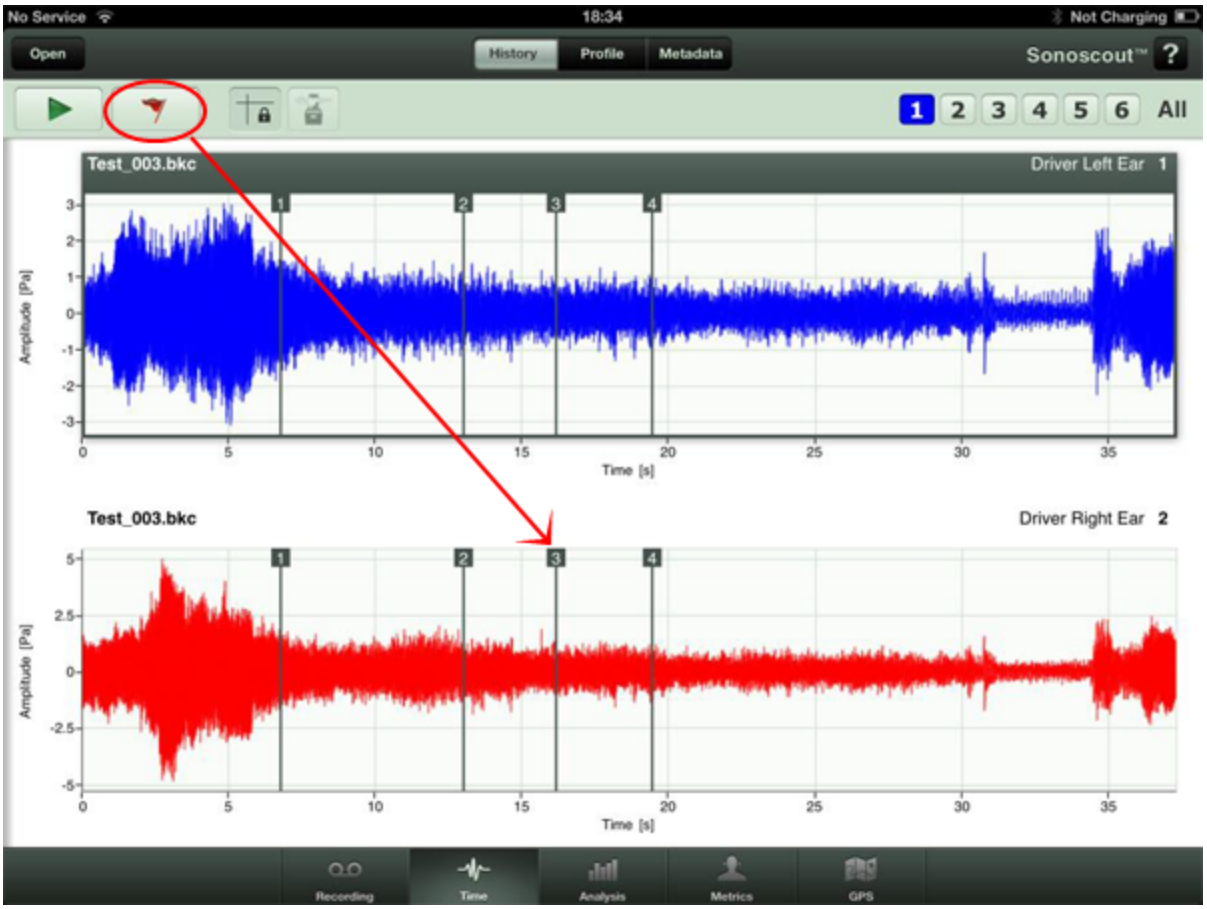


Markers

If you tap the **Marker** button during a recording, you add numbered markers to the recorded file:



These are shown on all time history displays on the Time and Analysis tabs. If you tap the **Marker** button in the Time task, it will add a new marker and renumber any existing markers to ensure they remain sequential:



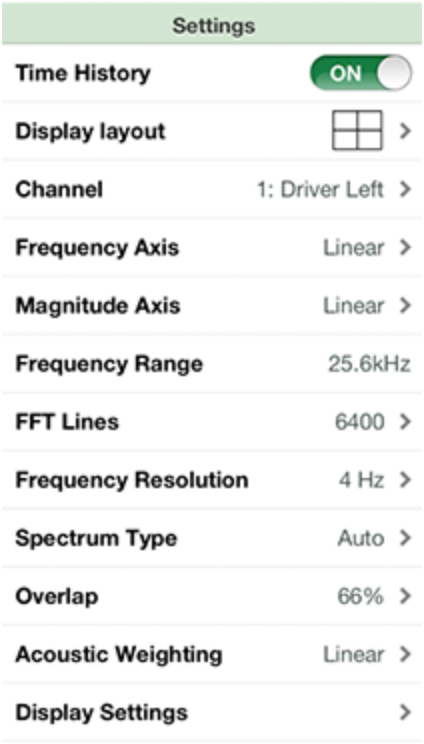
If you open the Metadata sub-task, the markers are listed along with their time positions. If you tap on one of the markers in the list, and swipe to the left, you can delete the marker.

Analysing Spectral Data

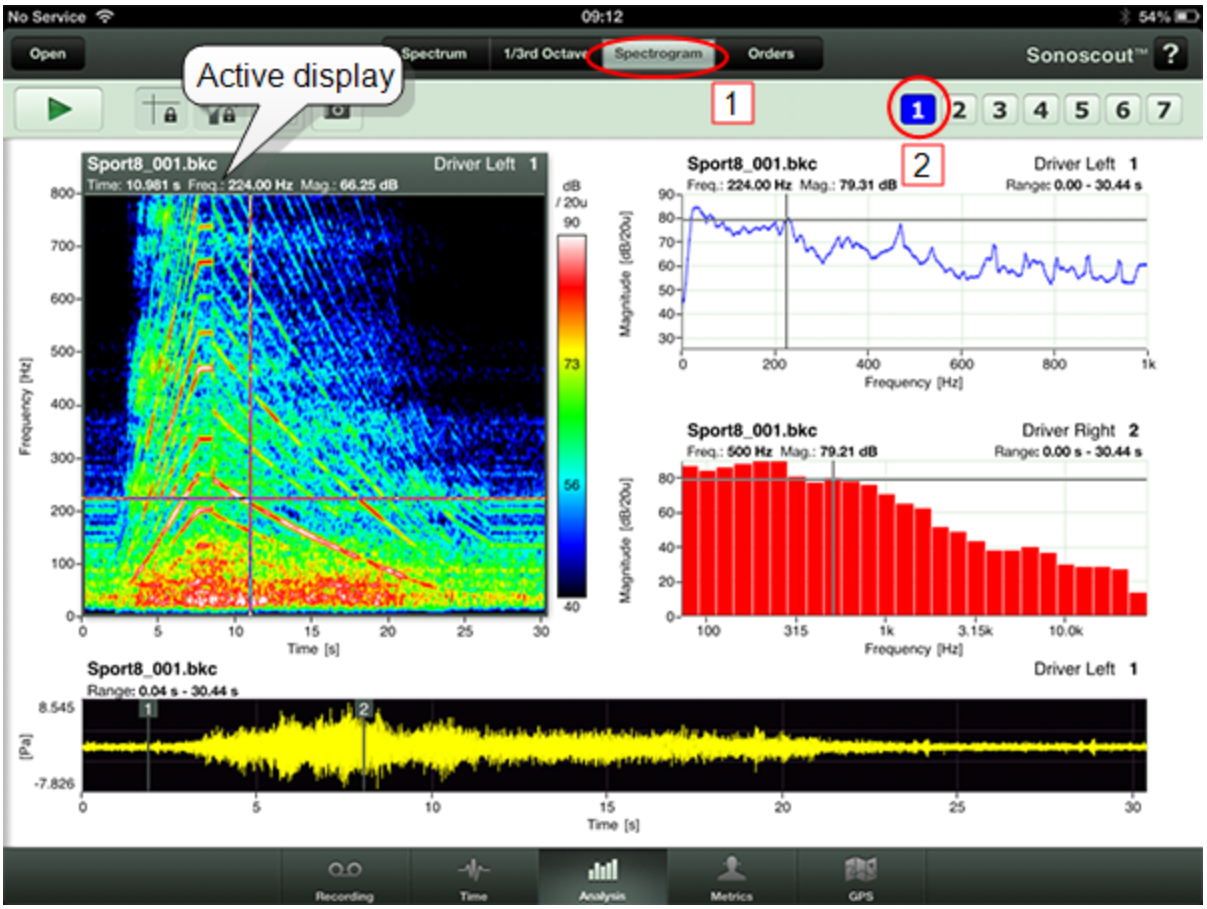
How the Displays Work

1. Open the file.
2. Select *Display layout* on the settings panel and choose your layout:

3. Select the Time History, if required:



4. Touch a display to make it active. The title bar is highlighted in grey to make it obvious that it is the active display:



5. Choose the type of spectrum to be displayed in the active display (see [1] above).
6. Open the file to display.
7. Choose the channel to be displayed in the active display [2].

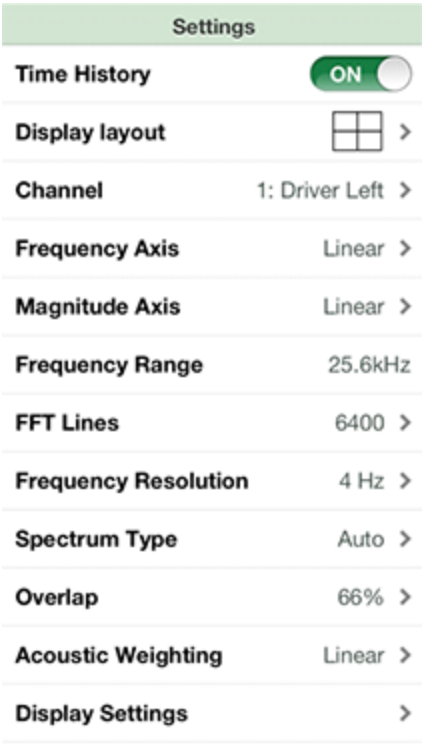
   The time history of the selected file and channel number will be displayed. The range is set to the complete time history as indicated by the black background. The average over the entire range is displayed for *Spectrum* and *1/3rd Octave*. The spectrogram and orders are displayed for the entire range. If you tap you will hear the file/channel displayed in the time history.
8. Repeat this process for all the other displays.

   Note: The active display is the 'master' which controls what you see and hear.

Calculation and Display Settings

Each display has its own display and calculation settings.
To change the calculation parameters:

1. Touch a display to make it active
2. Open the Settings menu and make the changes:



Note: Each display has its own settings, those above are for *Spectrum*.

To change the display settings:

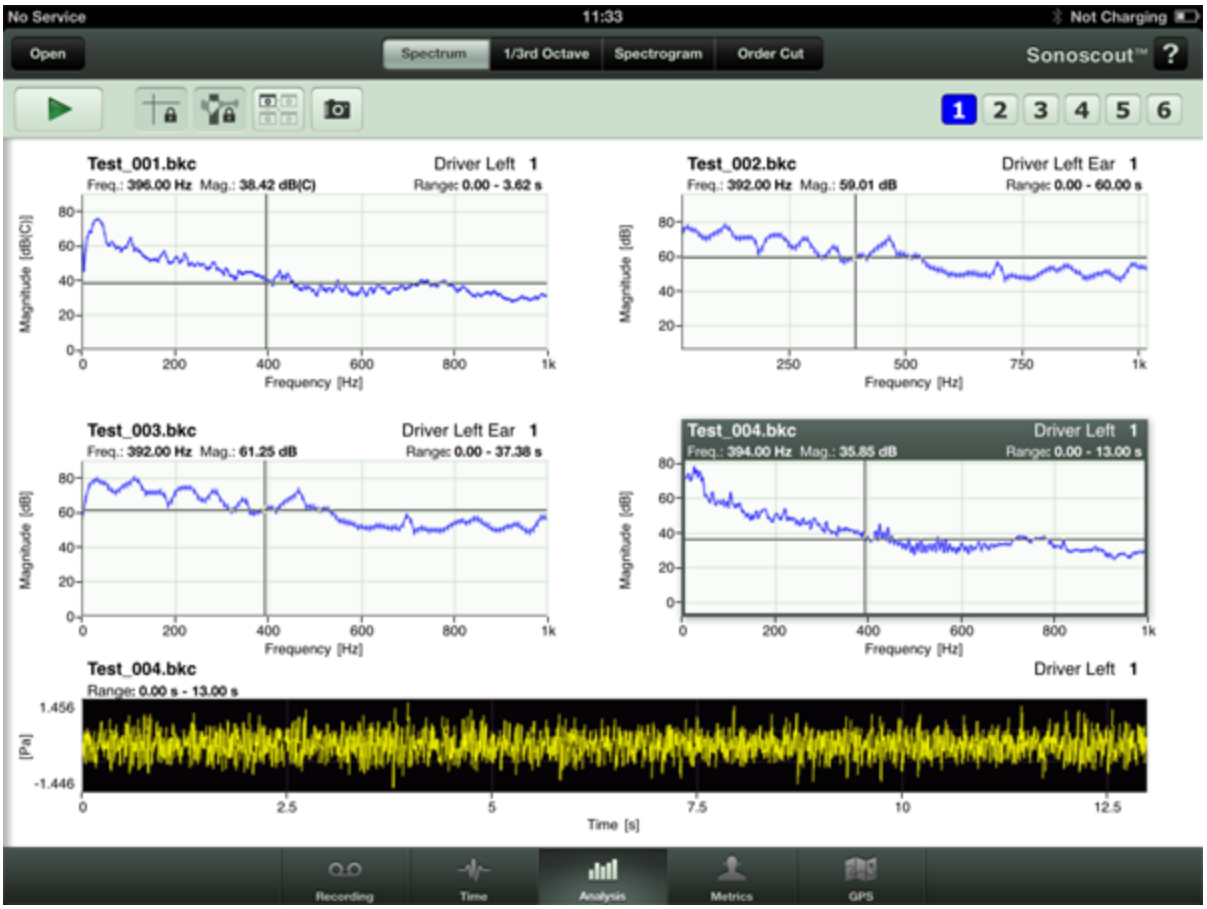
1. Touch a display to make it active
2. Open the Settings menu, tap on *Display Settings* and enter the default values in the Display Settings form.

   Note 1: These values are module dependant. FFT Lines and Frequency Resolution are linked.
   Note 2: If you use multi-touch to zoom in a display it does not change these settings.
   Note 3: Every time you double tap in a display it will apply these calculation and display settings to the active display, that is, it will restore the display to the way it looked before you zoomed in, or out on it.

Comparing Multiple Files

You can open a different file in each display:

1. Touch a display to make it active. Choose the type of spectrum and channel number to be displayed in the active display:



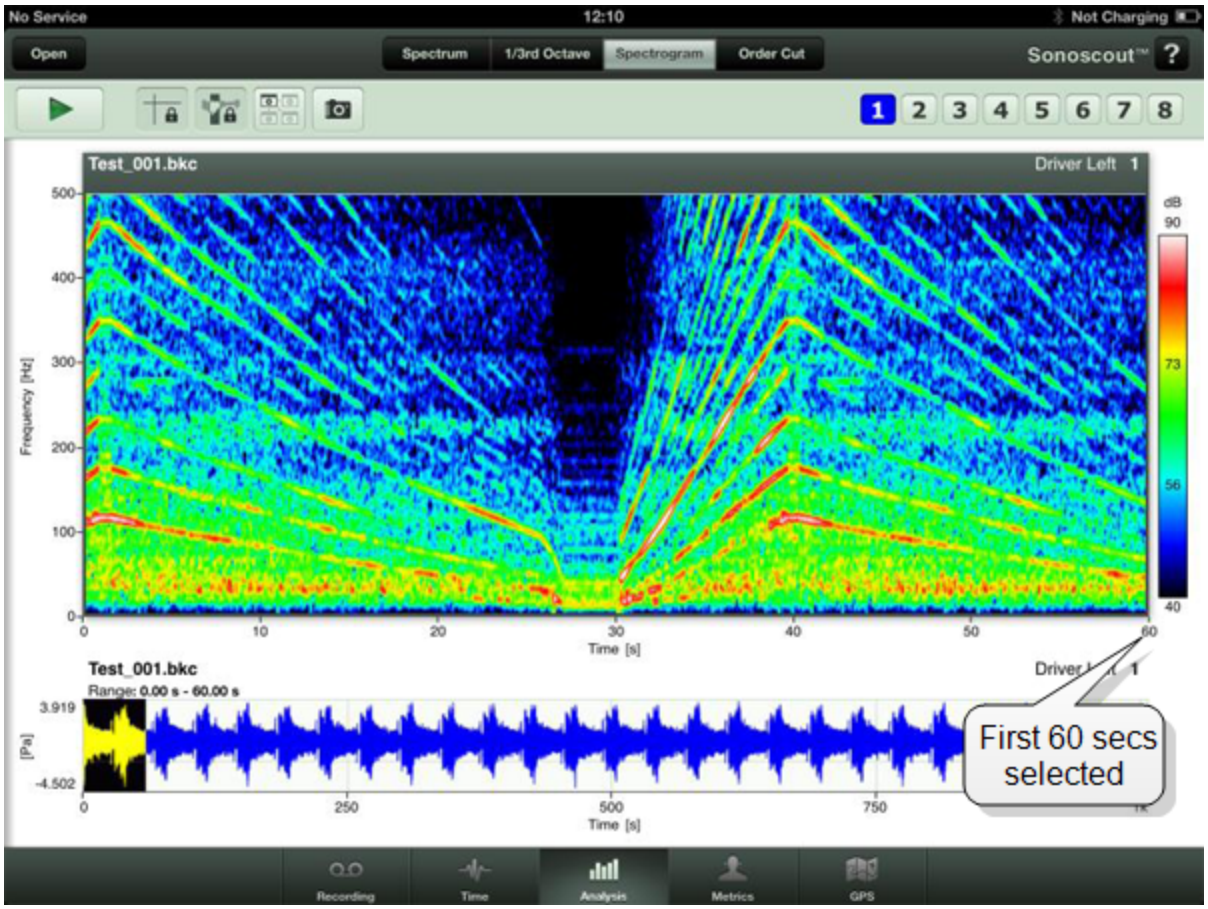
2. Use Open to select the file to be displayed in the active display.

3. Repeat this process for all the other displays.

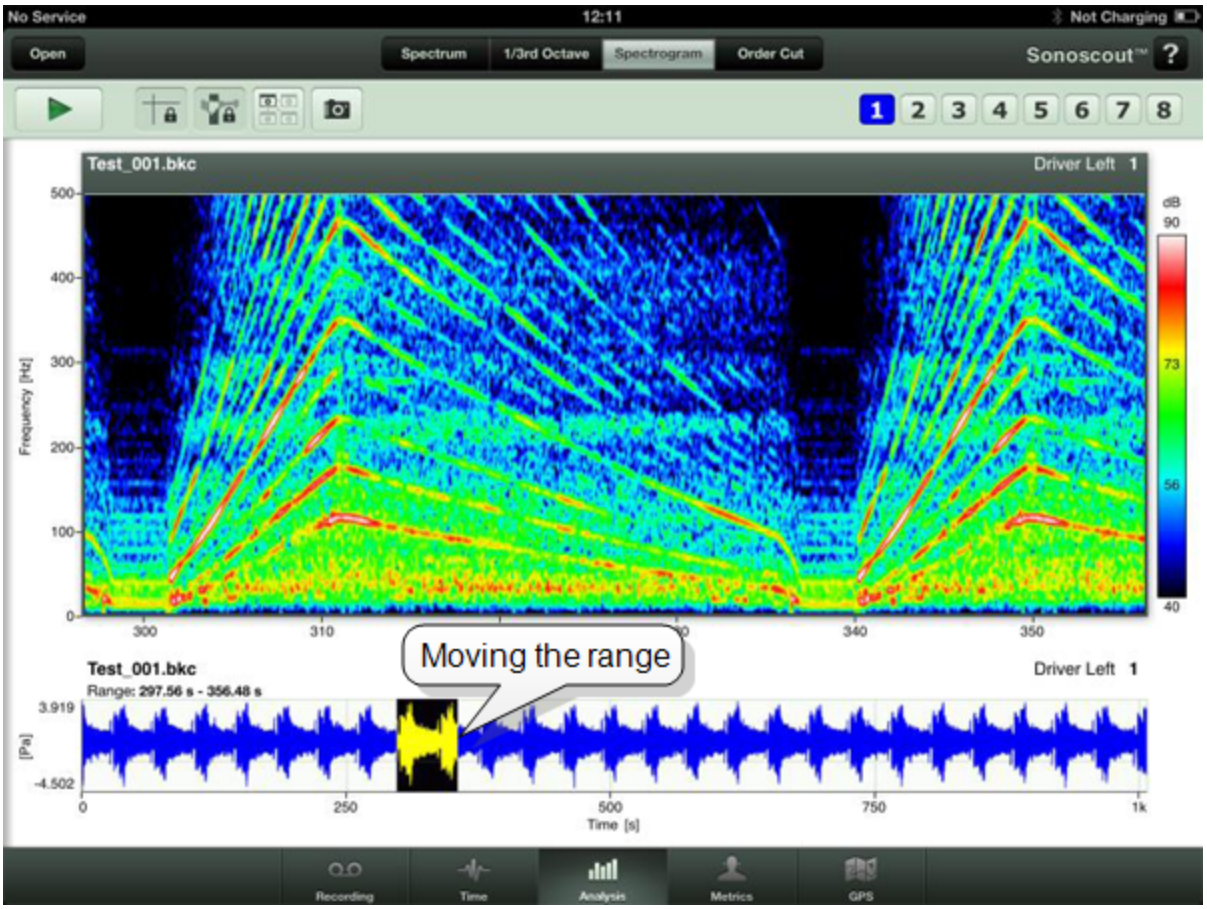
4. In the time history you can change the range or select a specific time point, which can be different for each file/display.

Long Files

1. If you open a file that is longer than 60 seconds, the first 60 seconds is automatically selected for spectral analysis:

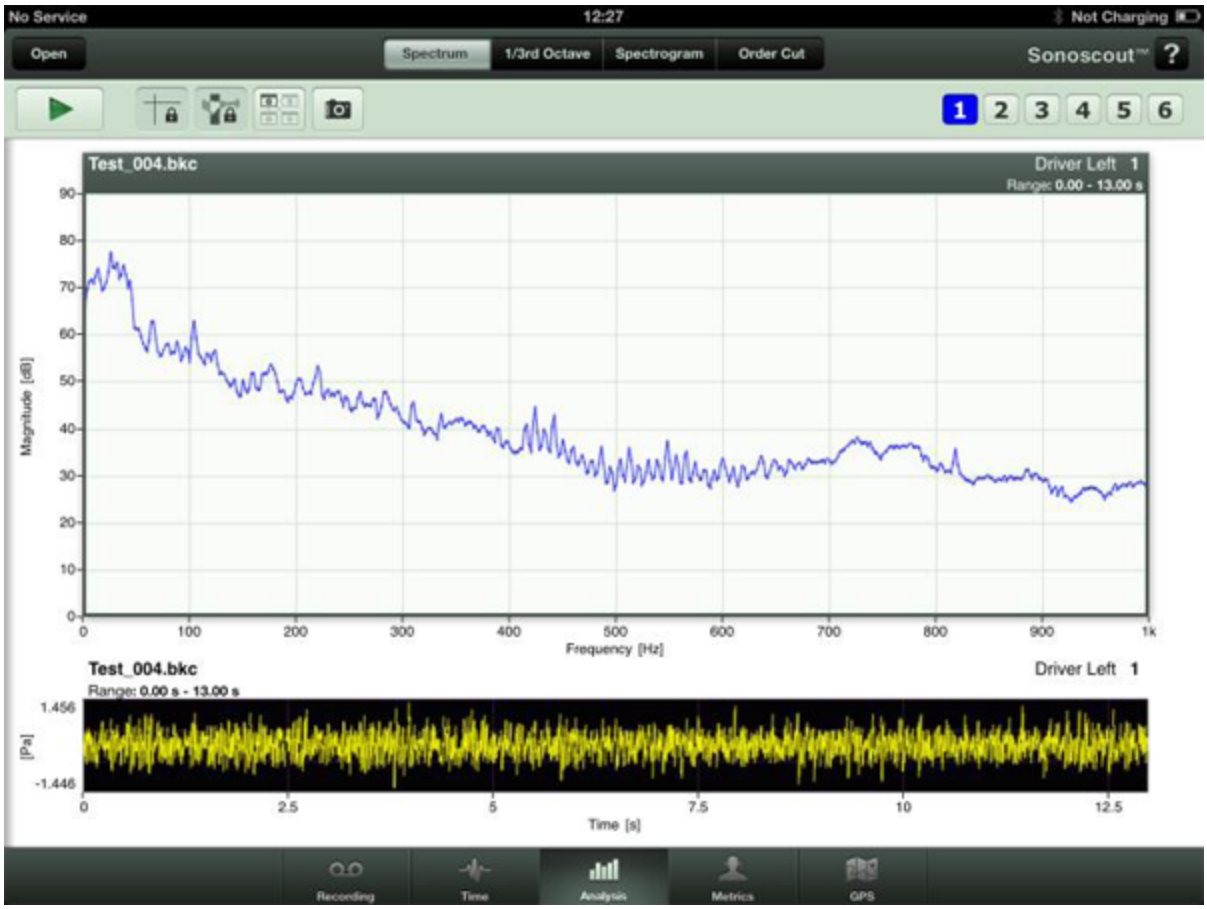


2. If you touch to the right of the end of the range, the range will move to the new position but will never get longer than 60 seconds. By holding your finger down on the time history you can slide the range to right or left to move it to the desired region. When you remove your finger the new spectrum is calculated:

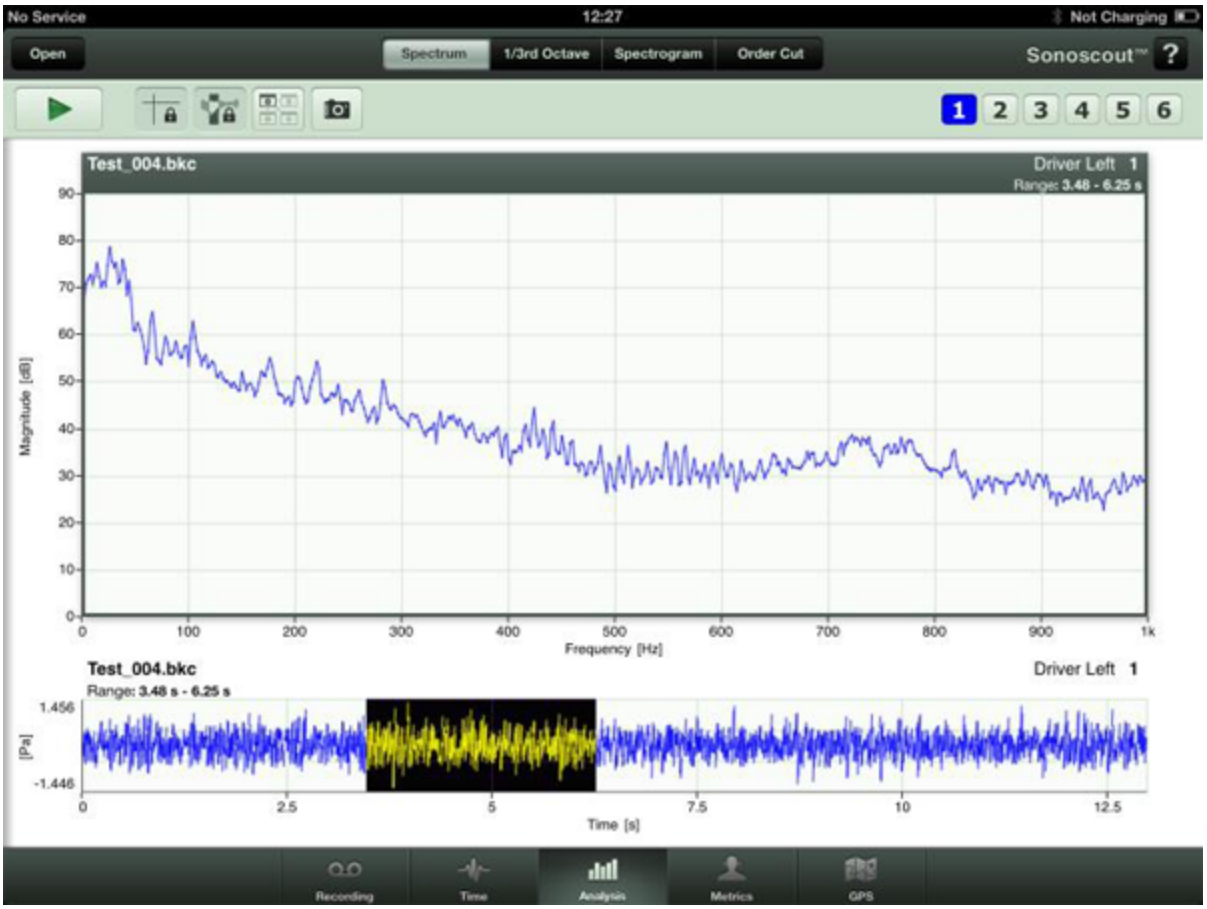


Instantaneous Versus Average Spectra

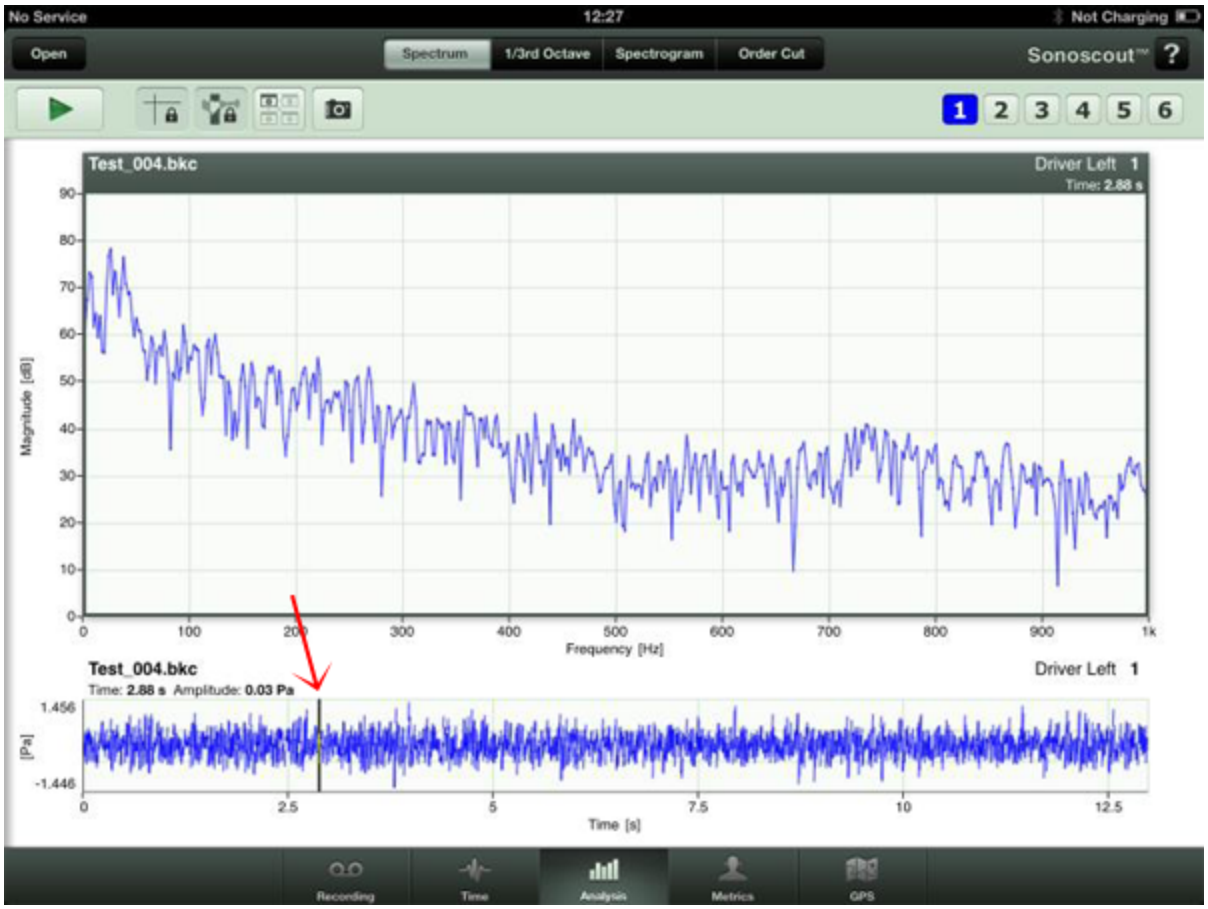
1. When you first open a file, the entire range is selected (up to a maximum of 60 seconds) and the average spectrum displayed:



2. You can drag a range to display the average spectrum for that range:

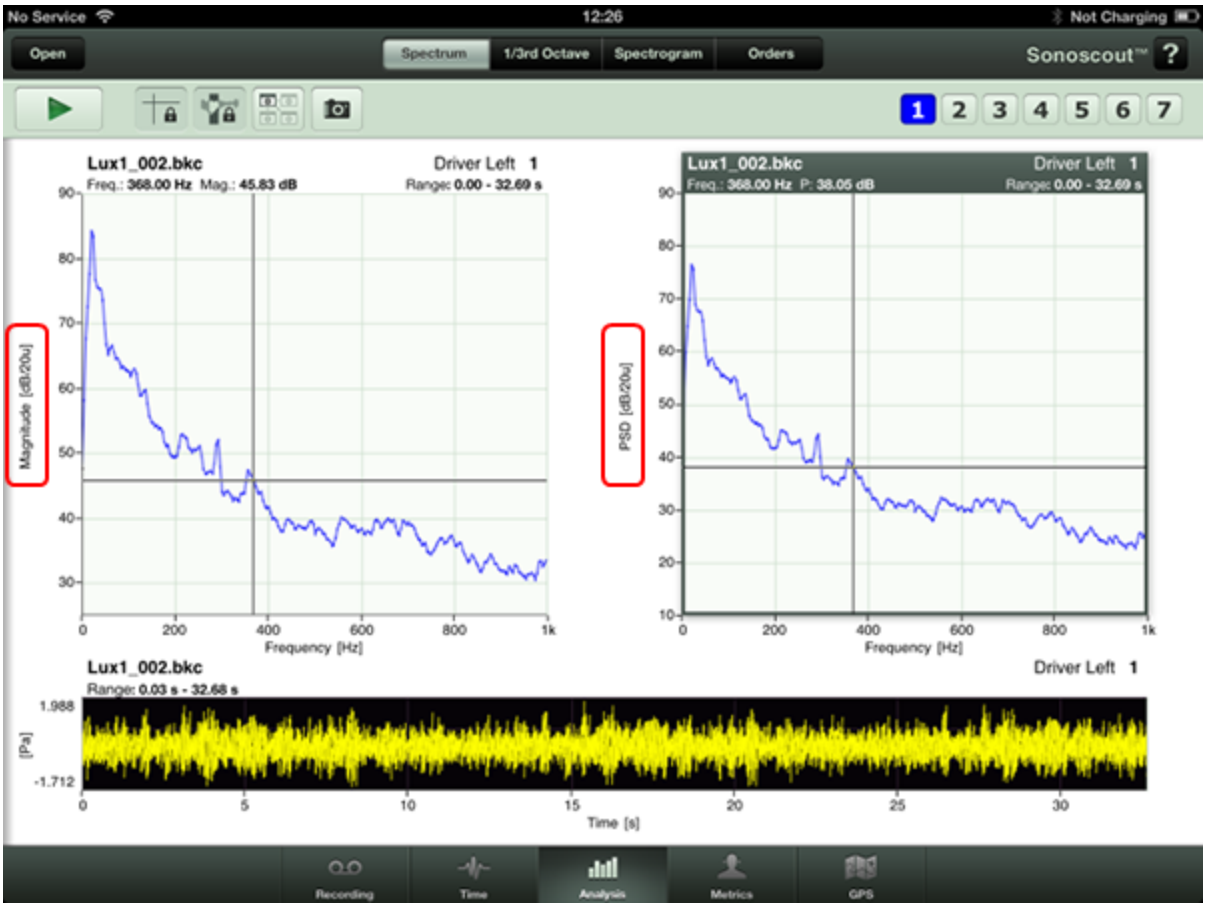


3. If you touch to put a cursor at a point in the time history the corresponding instantaneous spectrum is displayed:



4. If you tap the Play button the sound will start playing from this point and the display will show a real-time spectrum which changes according to the position of the play cursor.

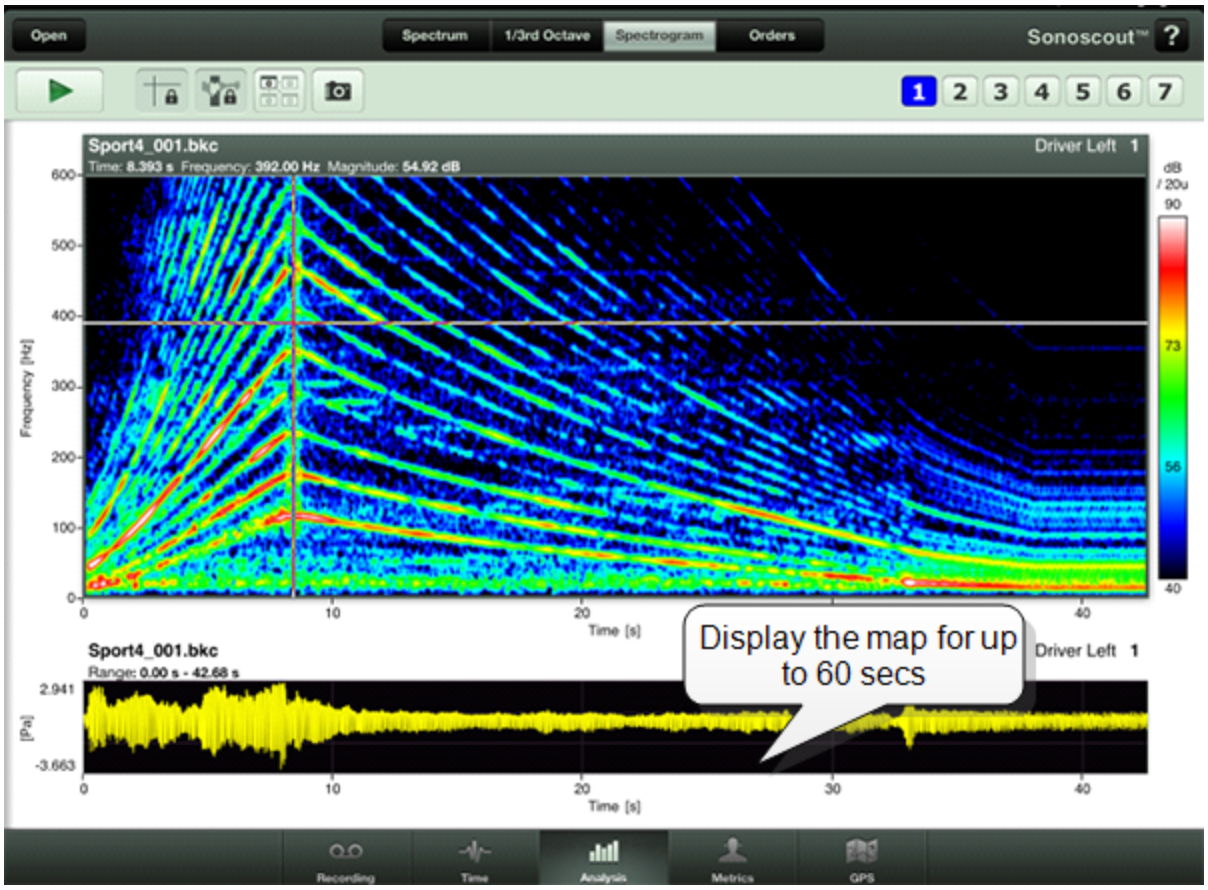
5. You can choose to display the spectrum as a PSD (Power Spectral Density) in units^2/Hz:



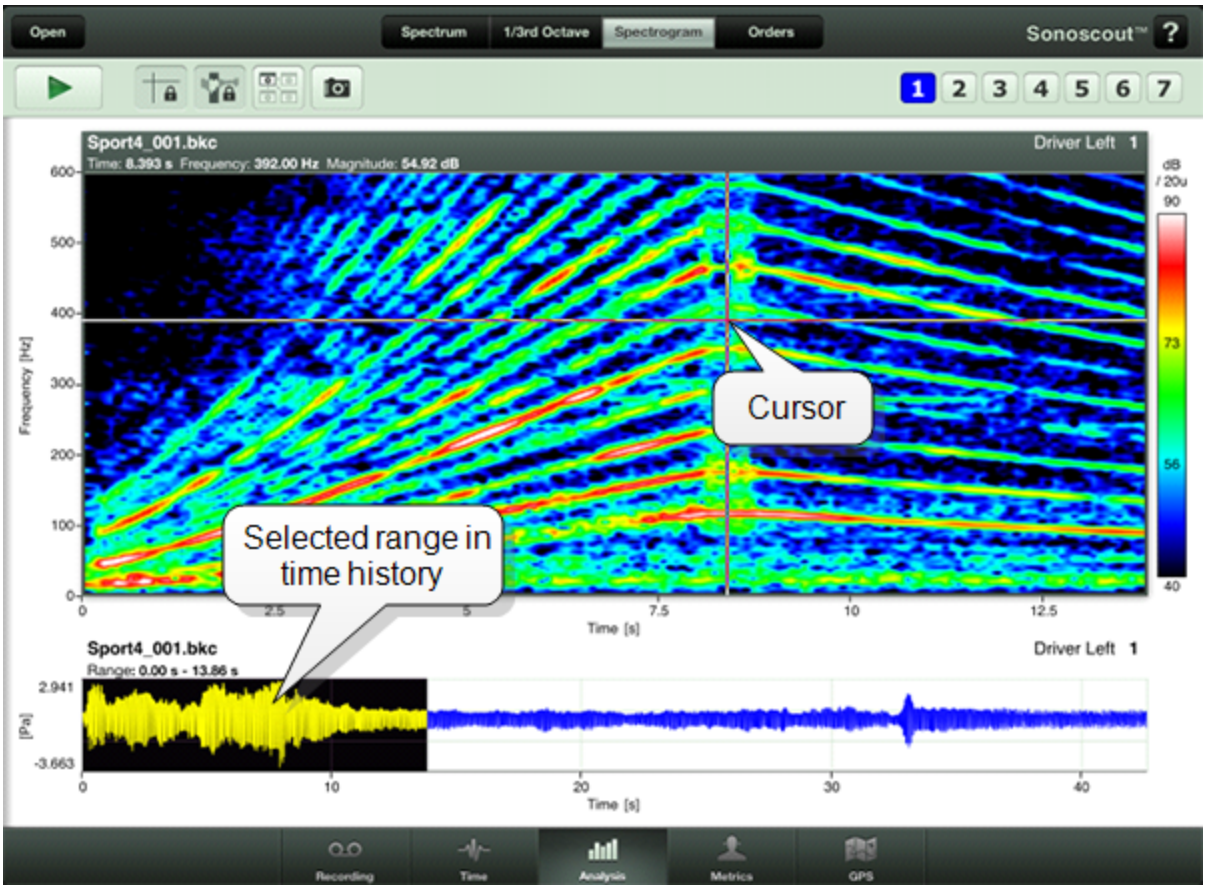
This is more appropriate for random signals than the Autospectrum, as it normalises by the frequency resolution of the spectrum. This means that data analysed with different resolutions can be directly compared.

Spectrogram

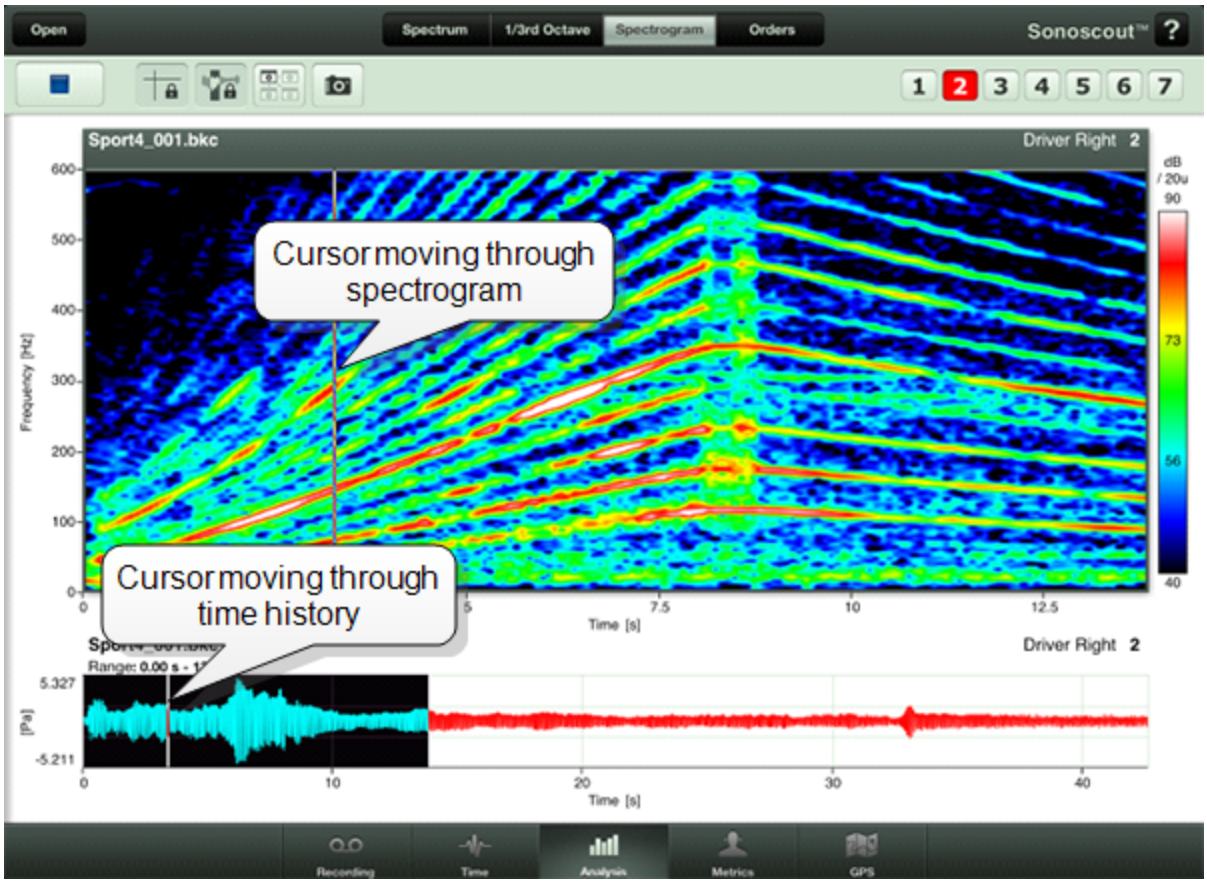
1. When you tap **Spectrogram**, the default behaviour is to display the map for up to the first 60 seconds of time data:



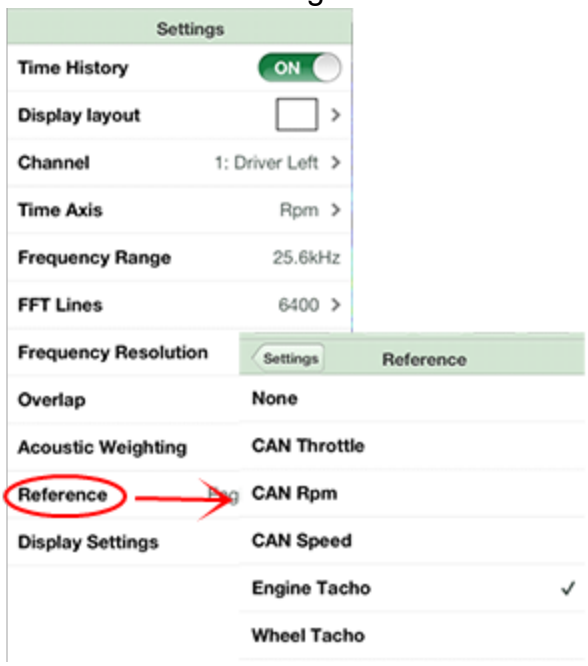
2. If you select a range in the time history, the spectrogram is calculated over the same range. There is a cross-hair cursor which follows your finger as you move it around on the display:

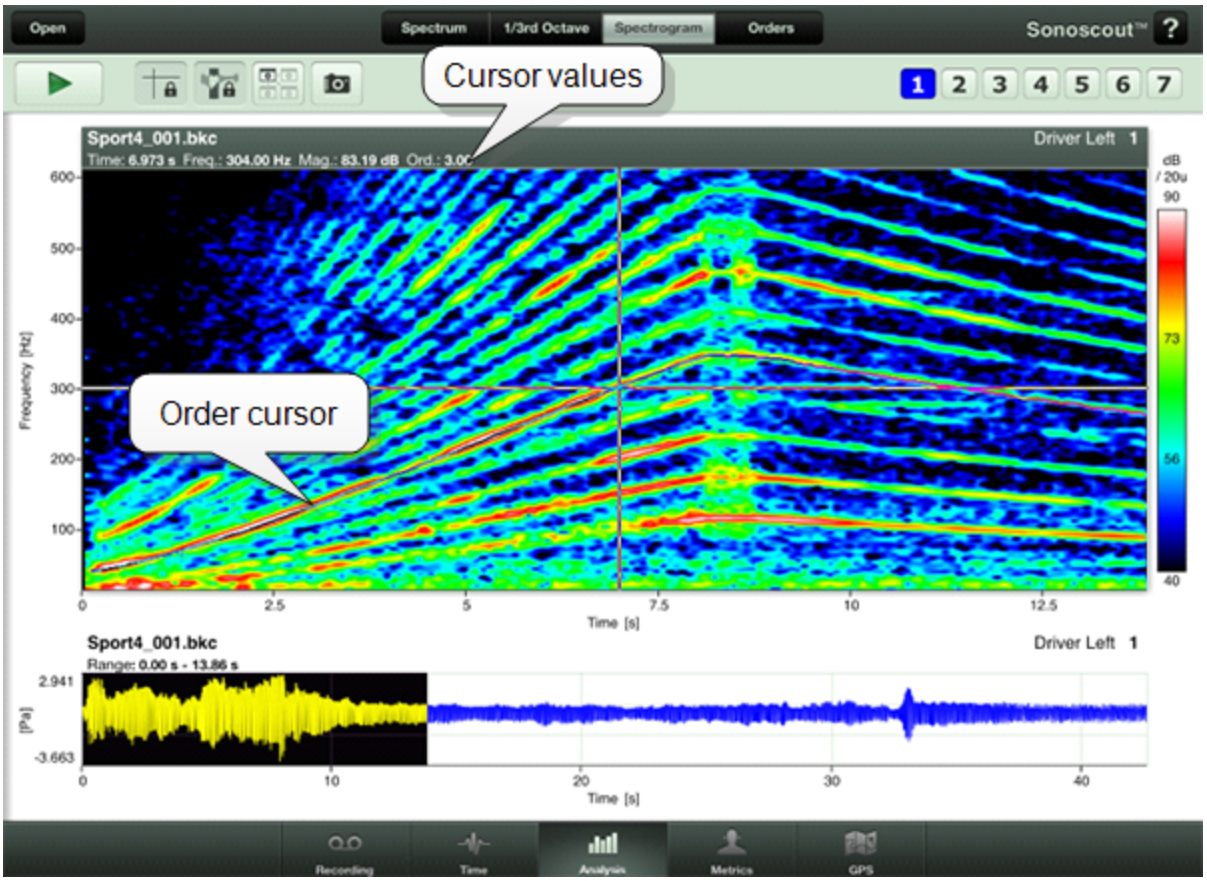


3. If you play the selected channel, a play cursor moves through the time history and the spectrogram

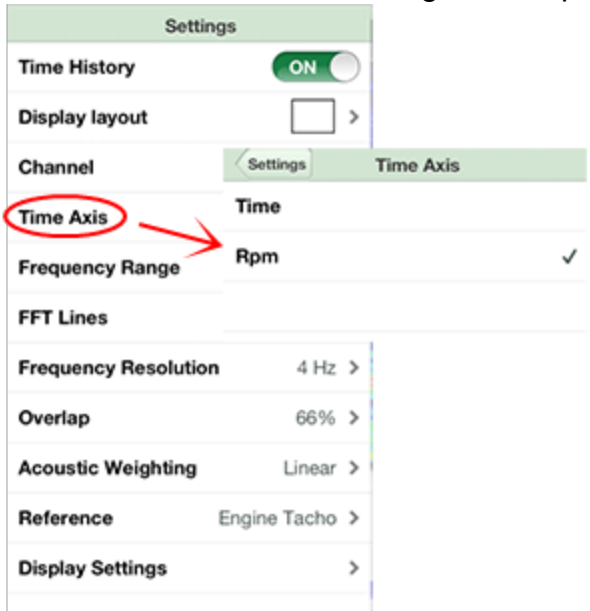


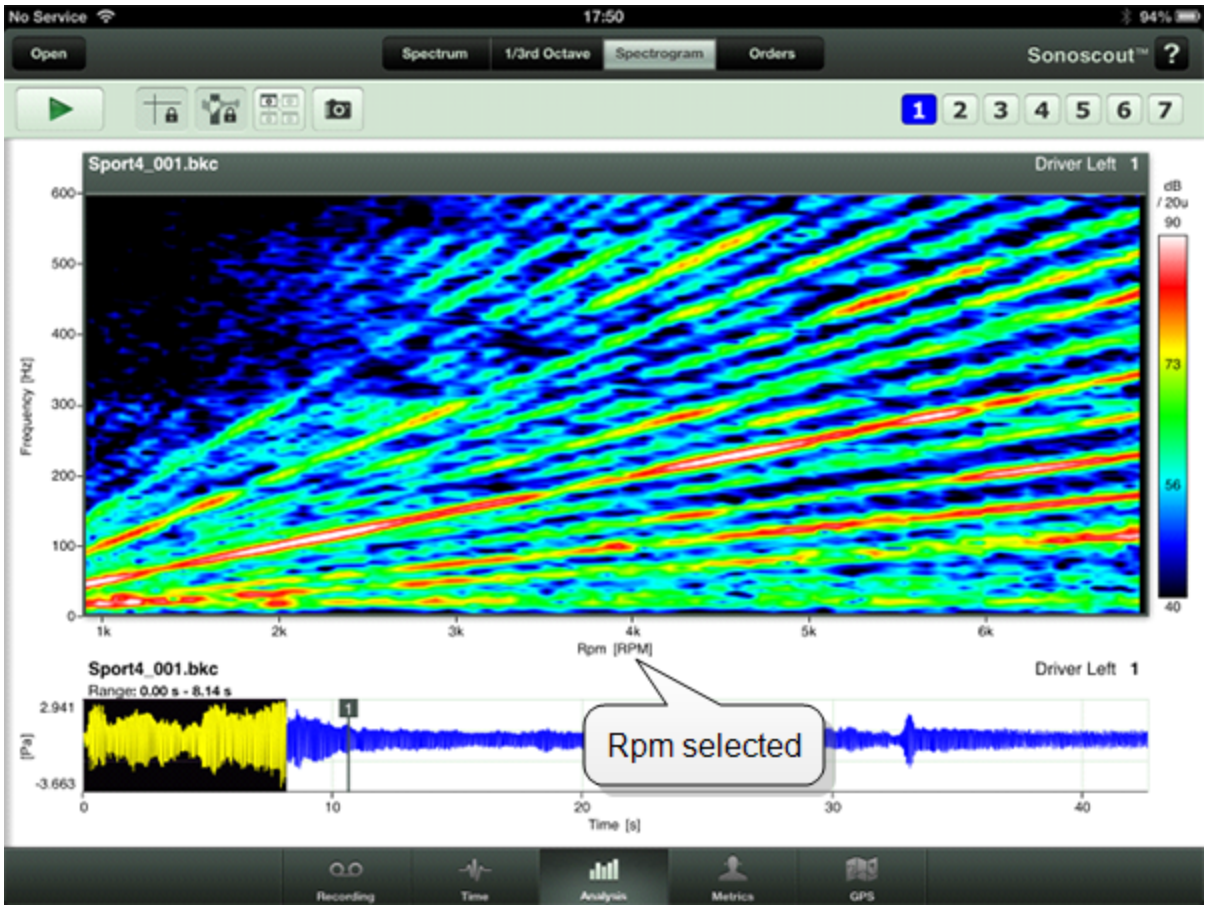
4. If you choose a Reference profile (all those available are shown under *Reference* in the settings menu), an additional order cursor is displayed and the Order number for the current cursor position is shown along with the other cursored values:



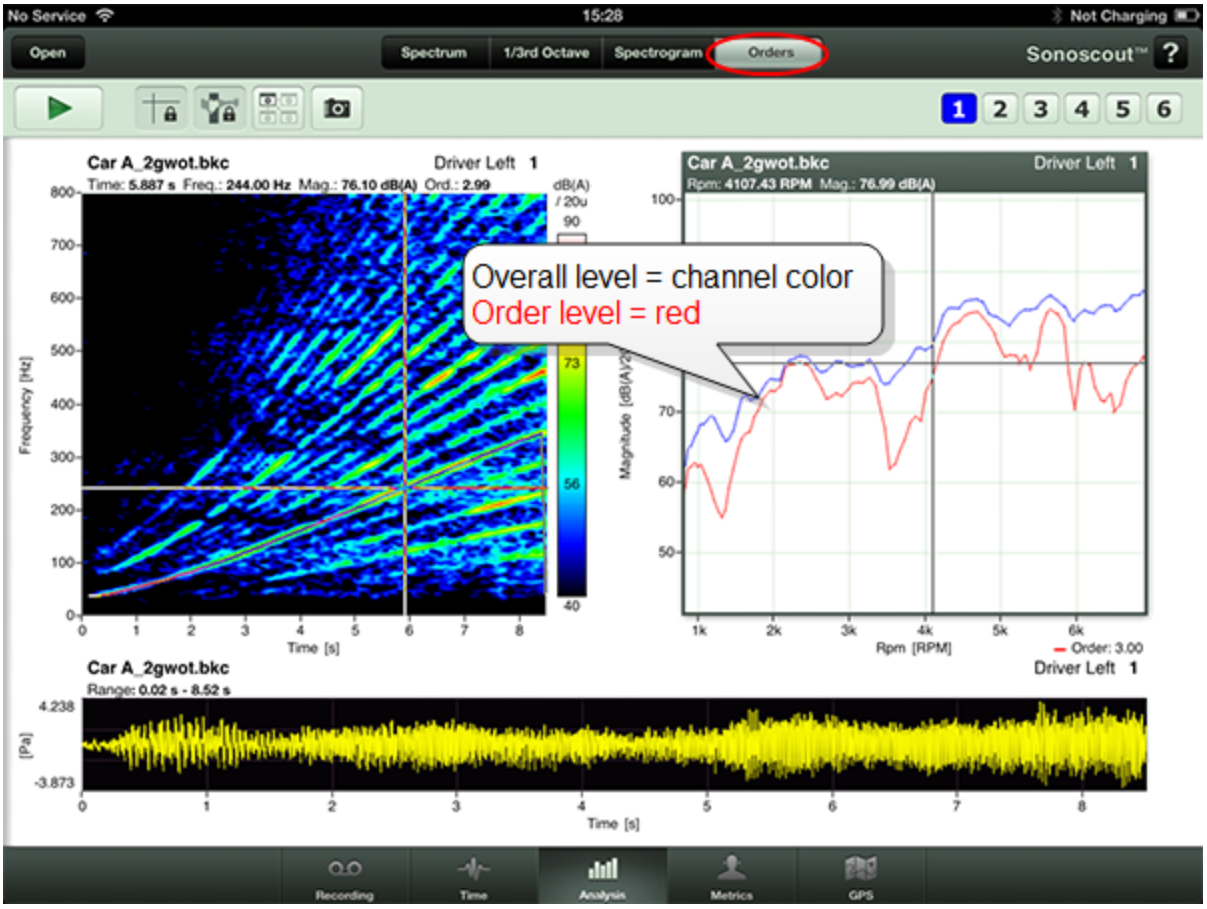


5. You can change the Time Axis from Time to RPM and the system will use the profile from the selected Reference channel to re-align the map:

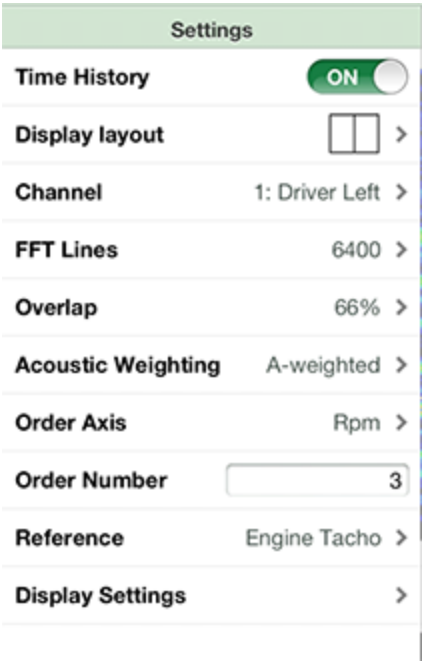



No Service
17:50
94%
Open
Spectrum
1/3rd Octave
Spectrogram
Orders
Sonoscout™
?
1 2 3 4 5 6 7
Sport4_001.bkc
Driver Left 1
dB / 20u
90
73
56
40
Frequency [Hz]
600
500
400
300
200
100
0
1k
2k
3k
4k
5k
6k
Rpm [RPM]
Sport4_001.bkc
Range: 0.00 s - 8.14 s
Driver Left 1
2.941
-3.663
[Pa]
0
10
20
30
40
Time [s]
Rpm selected
Recording
Time
Analysis
Metrics
GPS

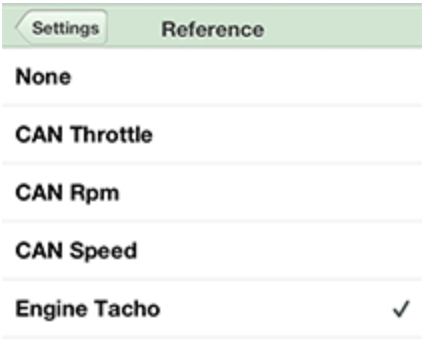
Order Analysis



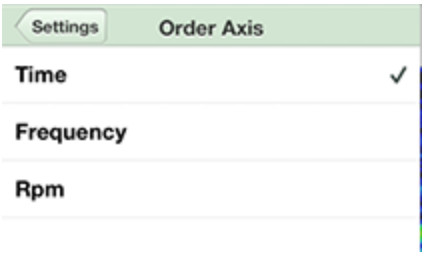
1. Use the Settings menu to set up the calculation and display parameters:



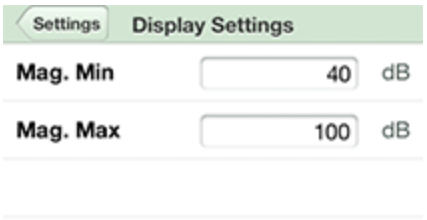
2. Tap on *Engine Tacho* or profile channel to use as the reference for cutting the order and displaying the result:



3. Specify the x-axis type:

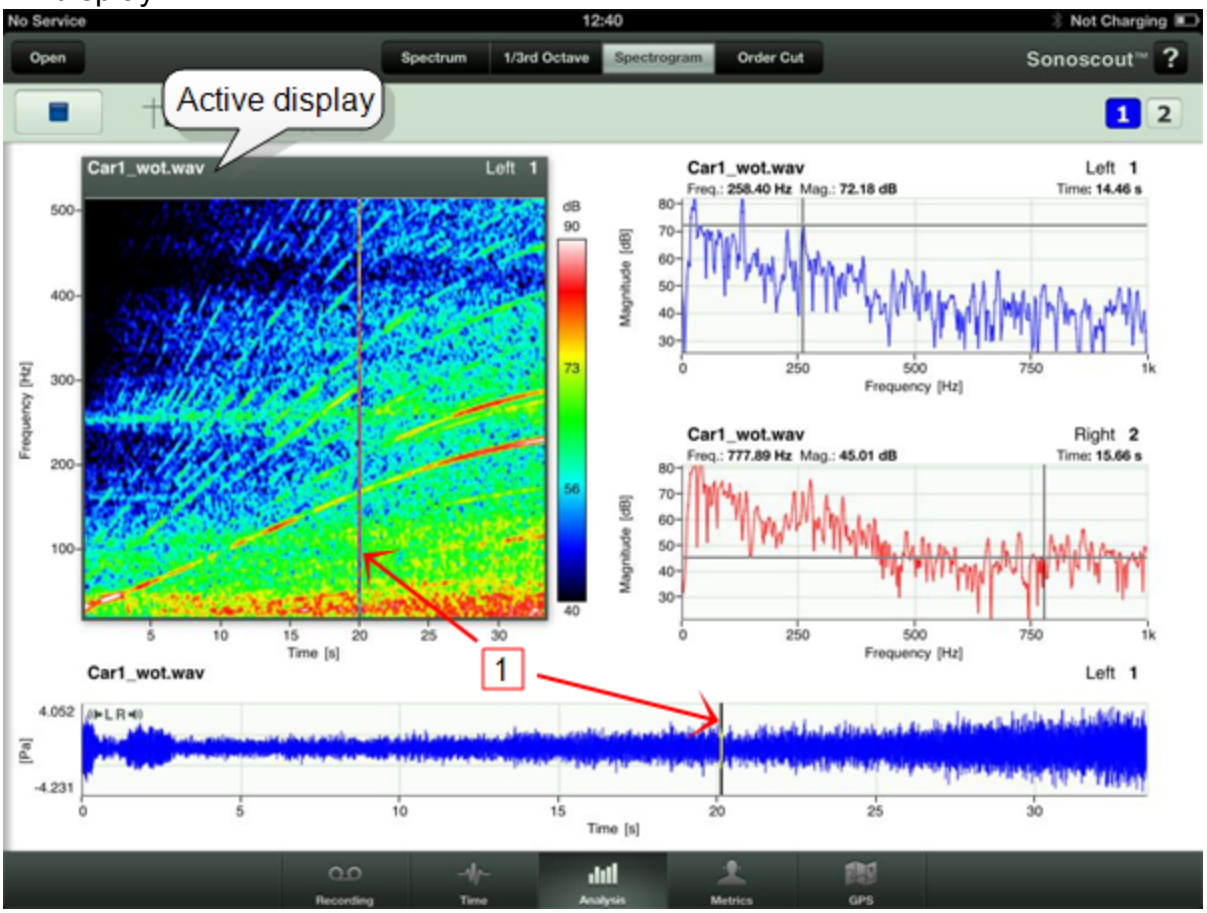


4. Enter the default values:



Play and Cursors

1. If you tap the **Play** button you will hear the sound for the file/channel in the active display:



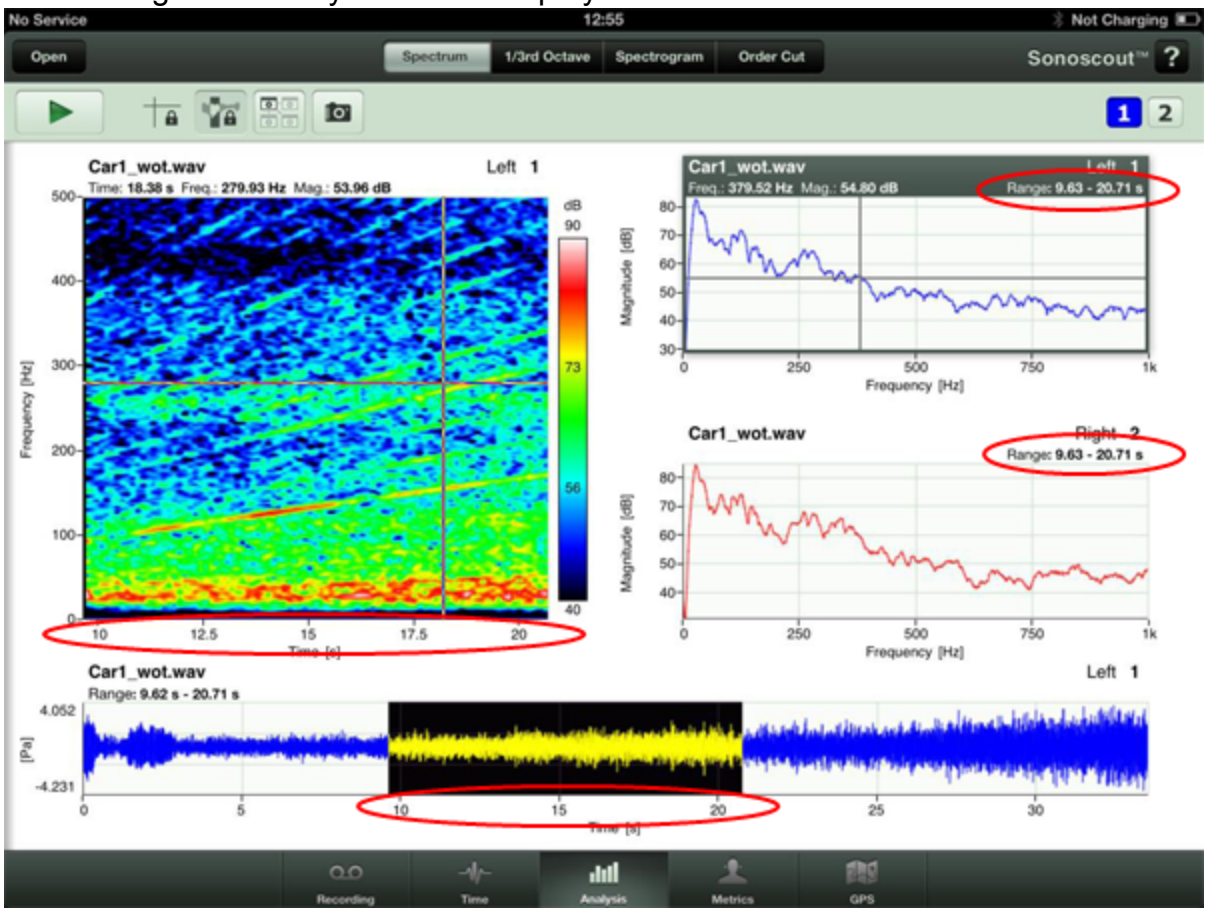
2. If this is a spectrum or 1\3-octave signal, you will see a real-time display which is synchronised to the play cursor in the time history. If the sound is not playing, the instantaneous spectrum is synchronised to wherever you position the cursor.

3. If it is a spectrogram there are synchronised play cursors in the spectrogram and time history (see [1] above).

4. If the **Cursor Synchronisation** button is off, the cursors are independent in each spectral display. If the button is on, the cursors are linked in each spectral display.

Range Synchronisation

1. If the **Range Synchronisation** button is off, each display can have a different range. If the button is on, each display from the same file as the active display has the range defined by the active display.



Note: This range is not applied to any other files which are currently open.

Propagate Settings

1. The **Propagate Setting** button allows you to apply the current settings from one display to all the other displays of the same type.

2. Calculation settings are applied to all displays.

3. Display settings are dependent on display type, for example, if the active display is a spectrogram it propagates the settings to any other spectrograms that are

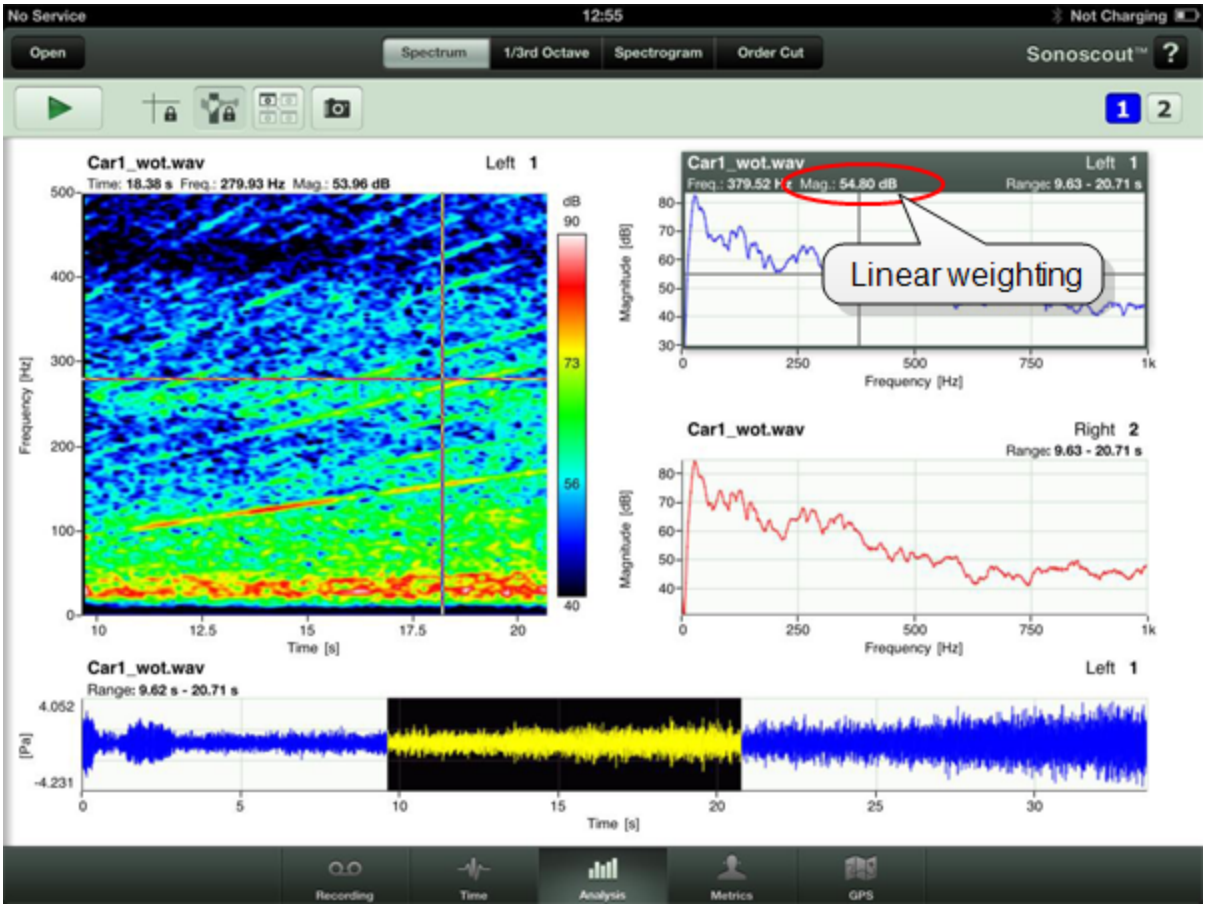
currently displayed.

4. The new settings will be used as the defaults for all new displays.

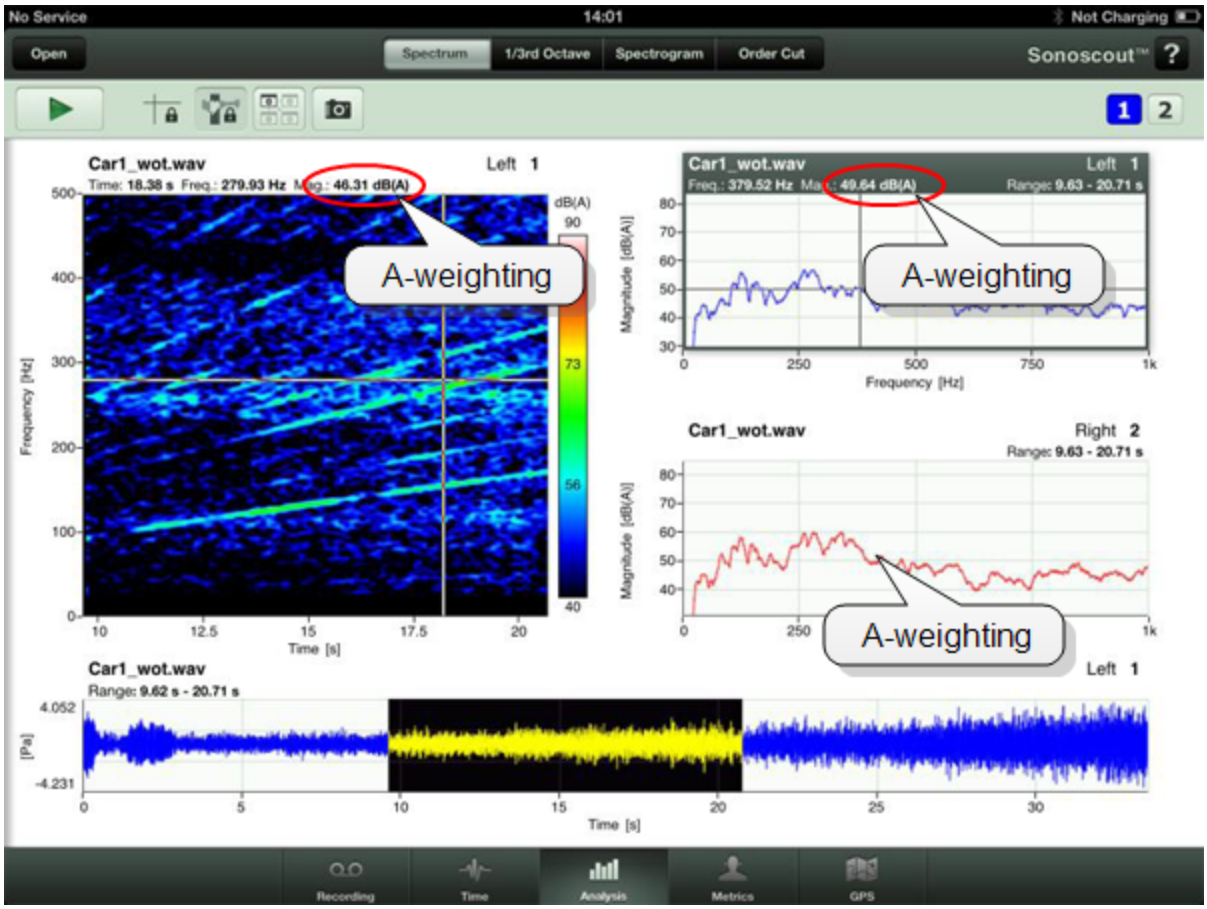
5. The system only propagates values from the forms, it does not propagate any zooming you may have done in a display using multi-touch.

   In the examples below, the weighting has been changed from *Linear* to *A-weighting* and this has been automatically applied to the other displays by using the **Propagate Settings** button.

   Display showing Linear weighting (before **Propagate Settings** button selected):

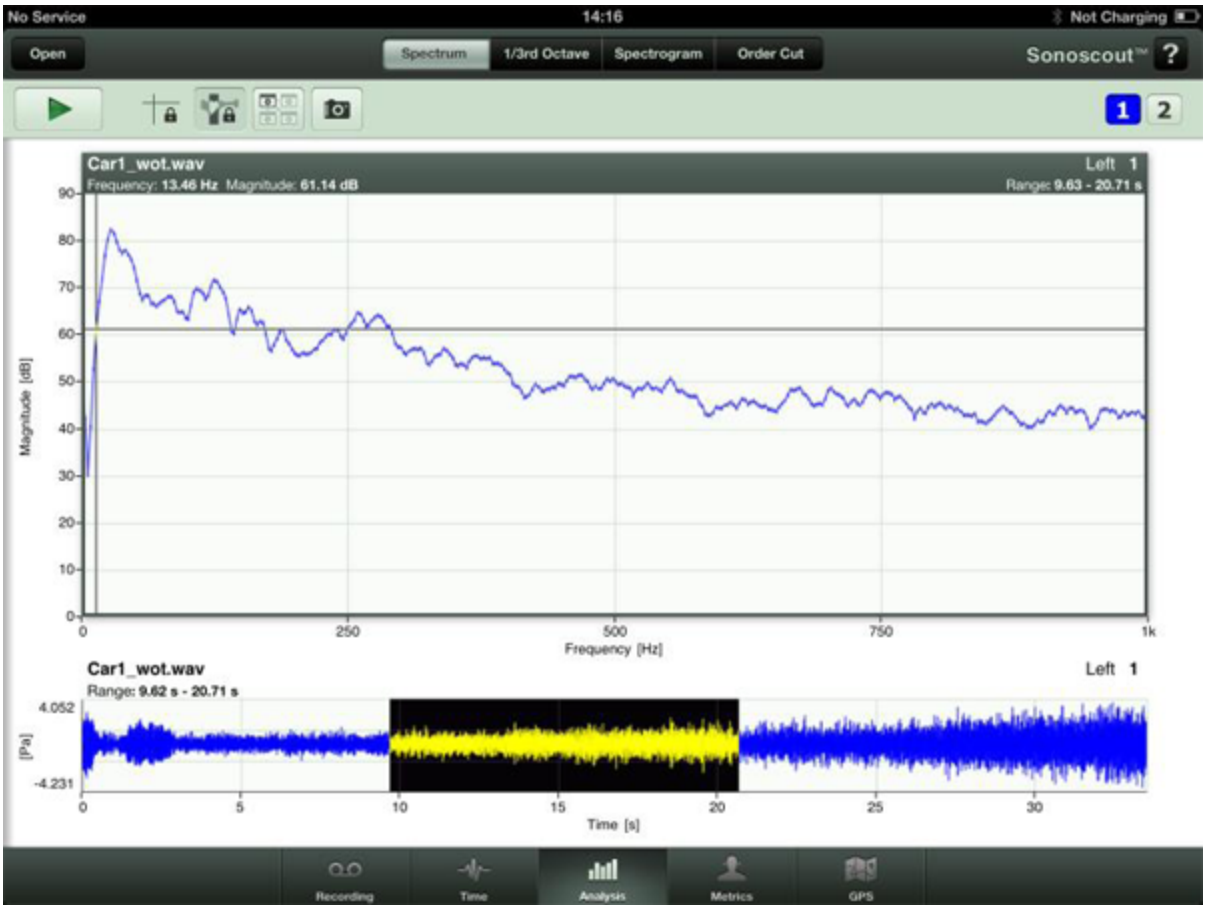


Display showing A-weighting (after **Propagate Settings** button selected).



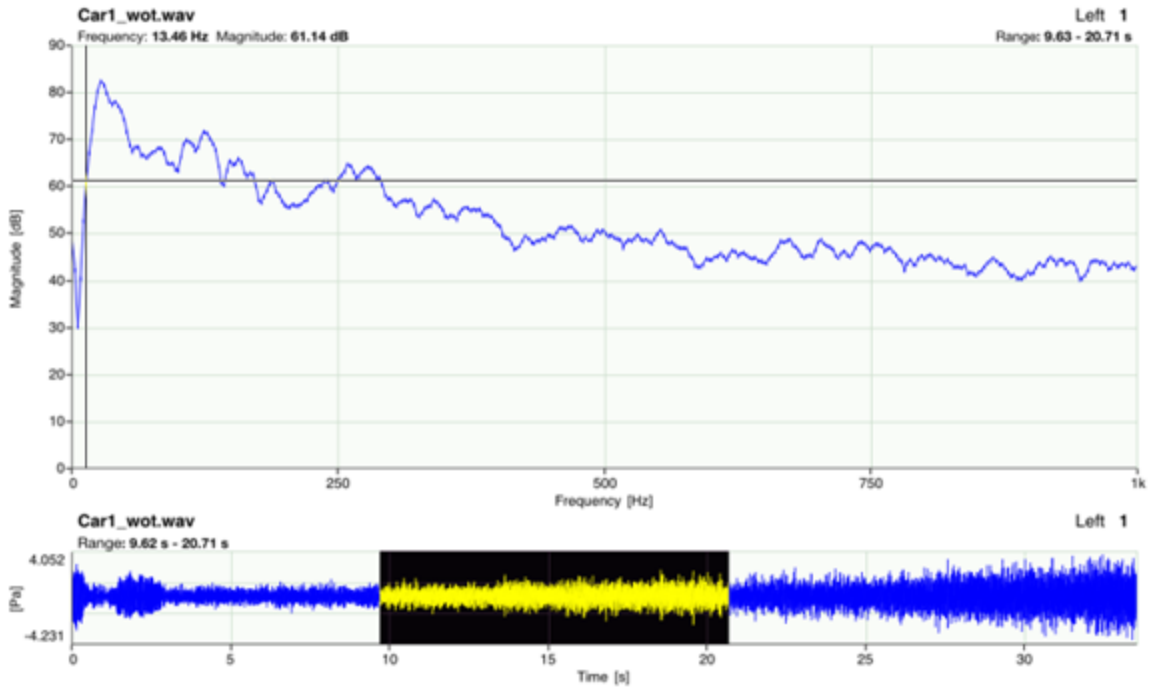
Taking Screenshots

1. You can take screenshots on the mobile device using standard Apple® functionality (pressing the **Home** button and **Power** button simultaneously):

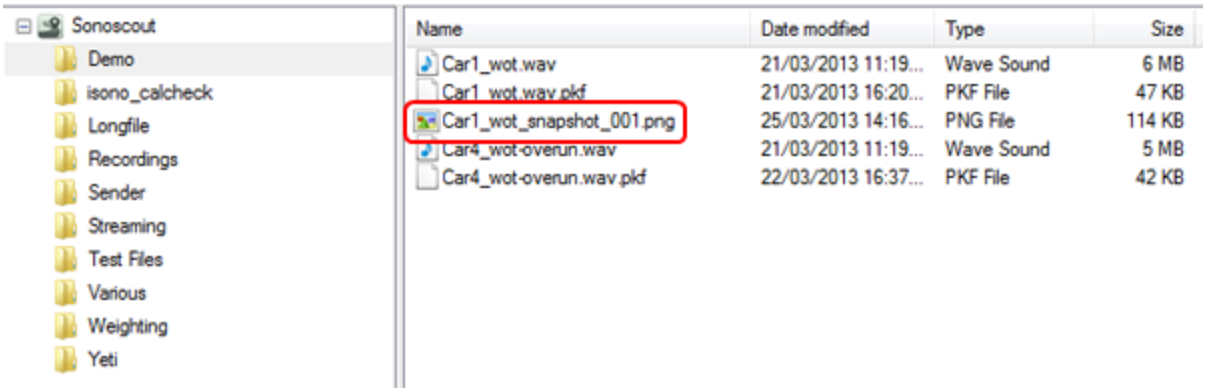


2. Or, you can use the button in this task (and the Metrics task).

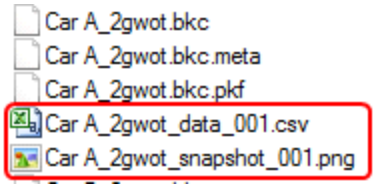
   The built-in 'camera' offers certain advantages.The first is that the pictures are report ready (that is, no trimming is required) and the highlighted title bar, which indicates the currently active window, is removed:

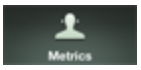


The second is that the pictures are automatically stored in the same folder as the original file and have the same base-name as the original file:



The third is that for all display types, other than Spectrogram, the content of the Active display is saved as a .csv file which has the same name as the image file:

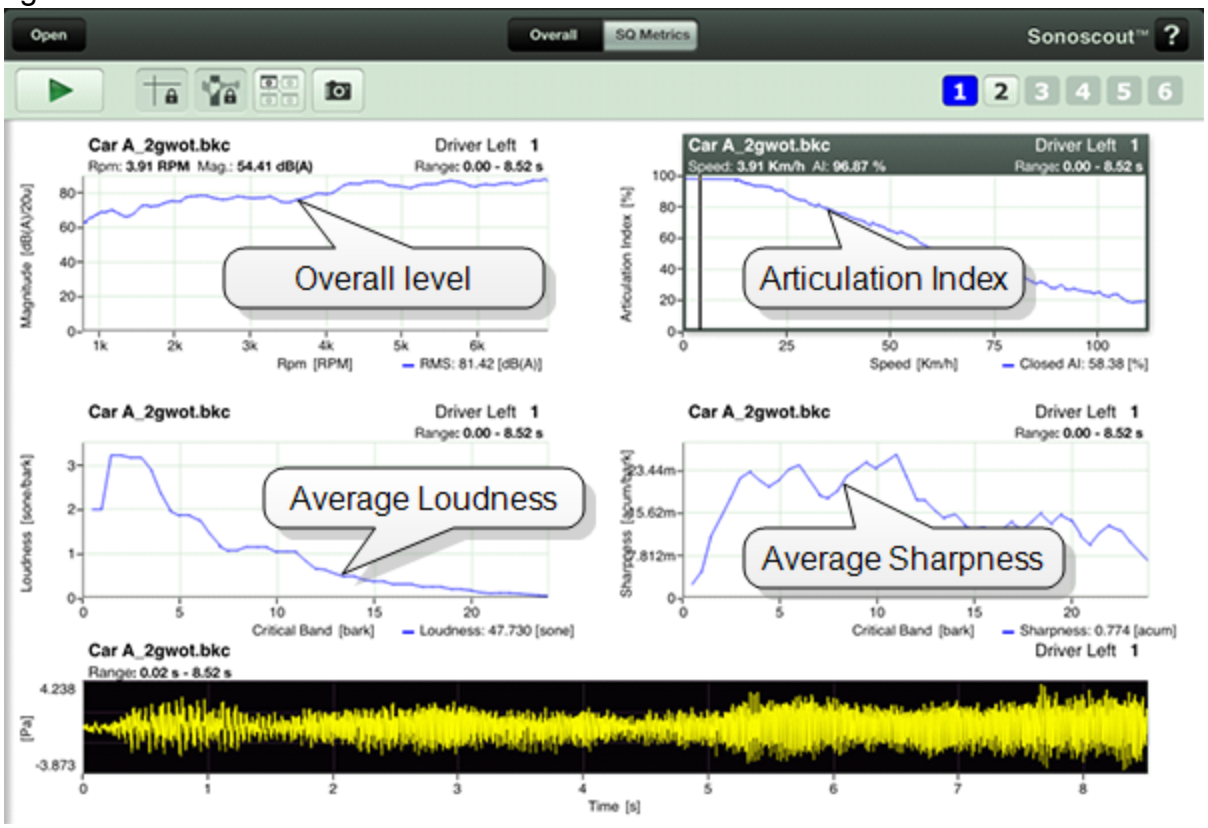


Viewing Metrics 

This task provides some simple metrics, these are as follows:

- Overall level as a function of Time, RPM or Speed
- Articulation index as a function of Time, RPM or Speed
- Average Loudness as a Critical Band Spectrum
- Average Sharpness as a Critical Band Spectrum

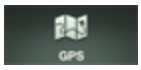
In each case the results are presented as curves or as the average value for the selected range:



Loudness and Sharpness use a CPB calculation, but Articulation uses 1/3-octave data synthesised from the FFT.

The options available and calculated are the same as in PULSE™ Reflex.

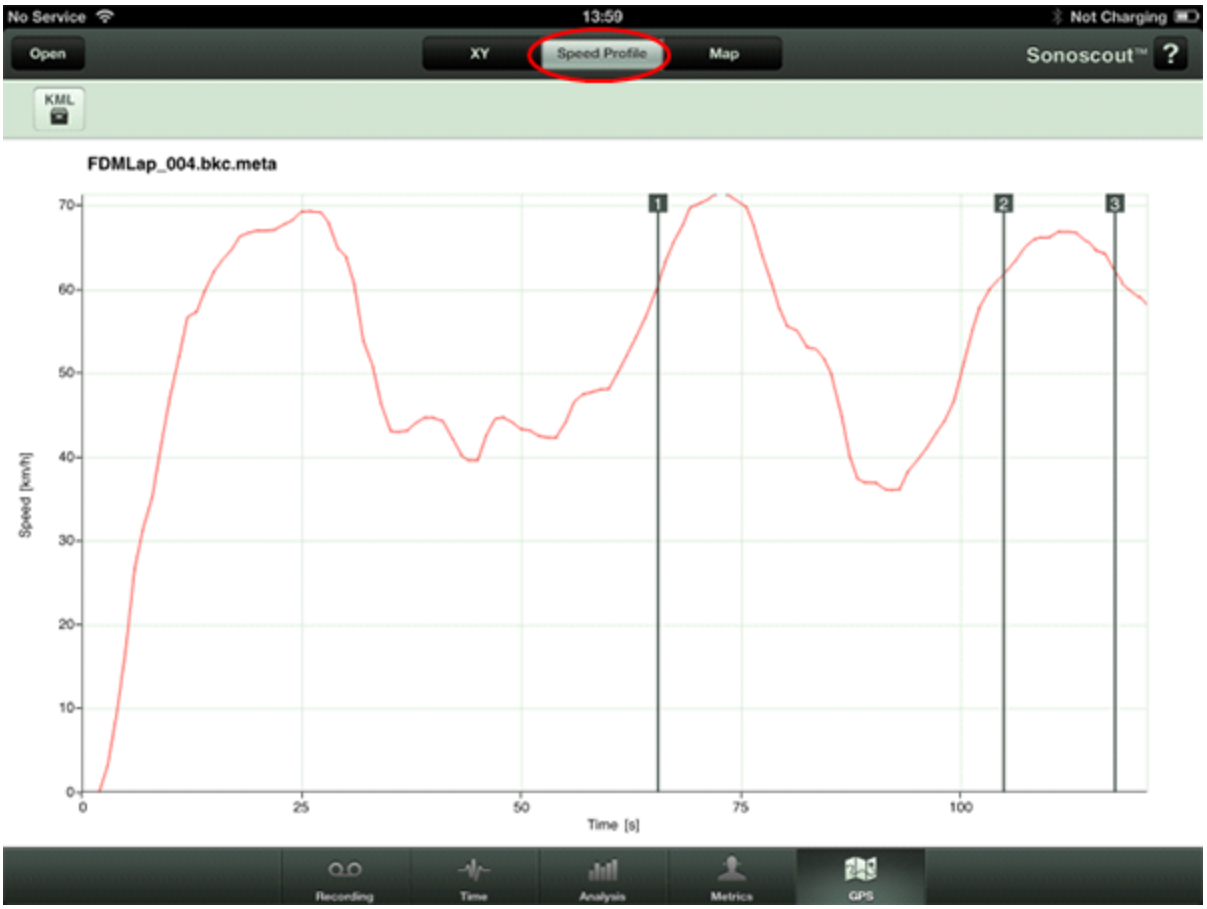
The display functionality is exactly the same as in the Analysis task.

Viewing GPS 

The GPS task allows you to view the GPS coordinates of the currently opened file. Alternatively, you can display the real-time speed profile, or, if you have an Internet connection, you can display a hybrid map with start and end positions marked.
There are four options available,

1. Display the X-Y coordinates:

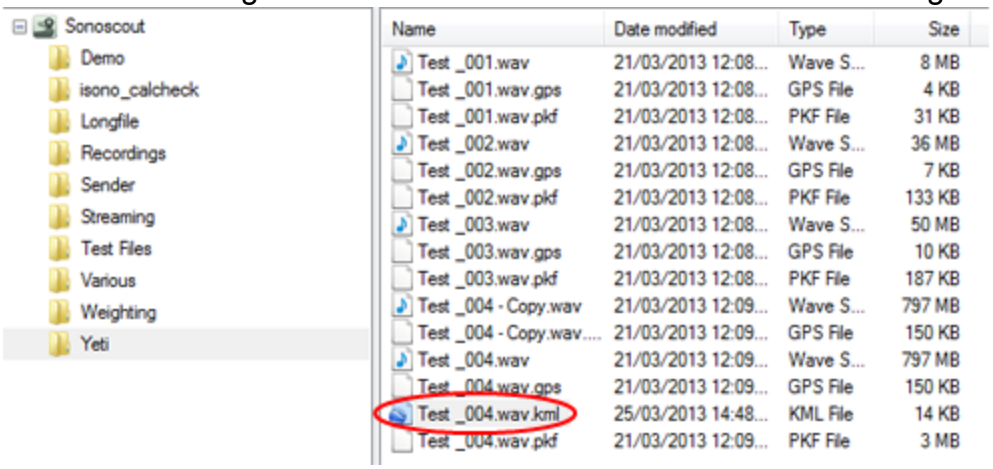
2. Display the Speed Profile:



3. If you have an Internet connection, tapping the **Map** button will display a hybrid map with the start and end positions marked:

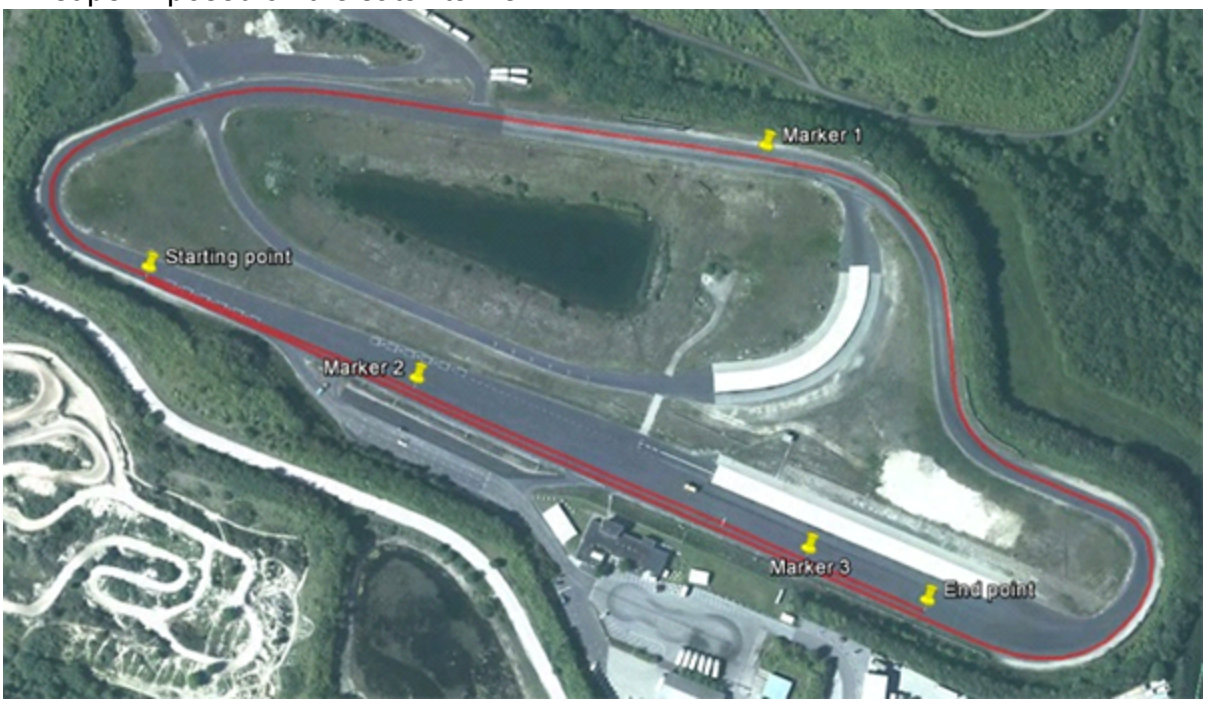
Note: This is not possible if you are connected to the wireless router in the module.

4. Export as a KML (Keyhole Markup File), which is automatically stored in the same folder as the original file and has the same base-name as the original file:


Sonoscout
Demo
isono_calcheck
Longfile
Recordings
Sender
Streaming
Test Files
Various
Weighting
Yeti
Name
Date modified
Type
Size
Test _001.wav 21/03/2013 12:08... Wave S... 8 MB
Test _001.wav.gps 21/03/2013 12:08... GPS File 4 KB
Test _001.wav.pkf 21/03/2013 12:08... PKF File 31 KB
Test _002.wav 21/03/2013 12:08... Wave S... 36 MB
Test _002.wav.gps 21/03/2013 12:08... GPS File 7 KB
Test _002.wav.pkf 21/03/2013 12:08... PKF File 133 KB
Test _003.wav 21/03/2013 12:08... Wave S... 50 MB
Test _003.wav.gps 21/03/2013 12:08... GPS File 10 KB
Test _003.wav.pkf 21/03/2013 12:08... PKF File 187 KB
Test _004 - Copy.wav 21/03/2013 12:09... Wave S... 797 MB
Test _004 - Copy.wav.... 21/03/2013 12:09... GPS File 150 KB
Test _004.wav 21/03/2013 12:09... Wave S... 797 MB
Test _004.wav.gps 21/03/2013 12:09... GPS File 150 KB
Test _004.wav.kml 25/03/2013 14:48... KML File 14 KB
Test _004.wav.pkf 21/03/2013 12:09... PKF File 3 MB
Test _004.wav.kml

5. Copy the KML file to your PC. If you have Google Earth™ installed, double-click on the KML file and it will show you the measured route (including markers)

superimposed on the satellite view:



File Management

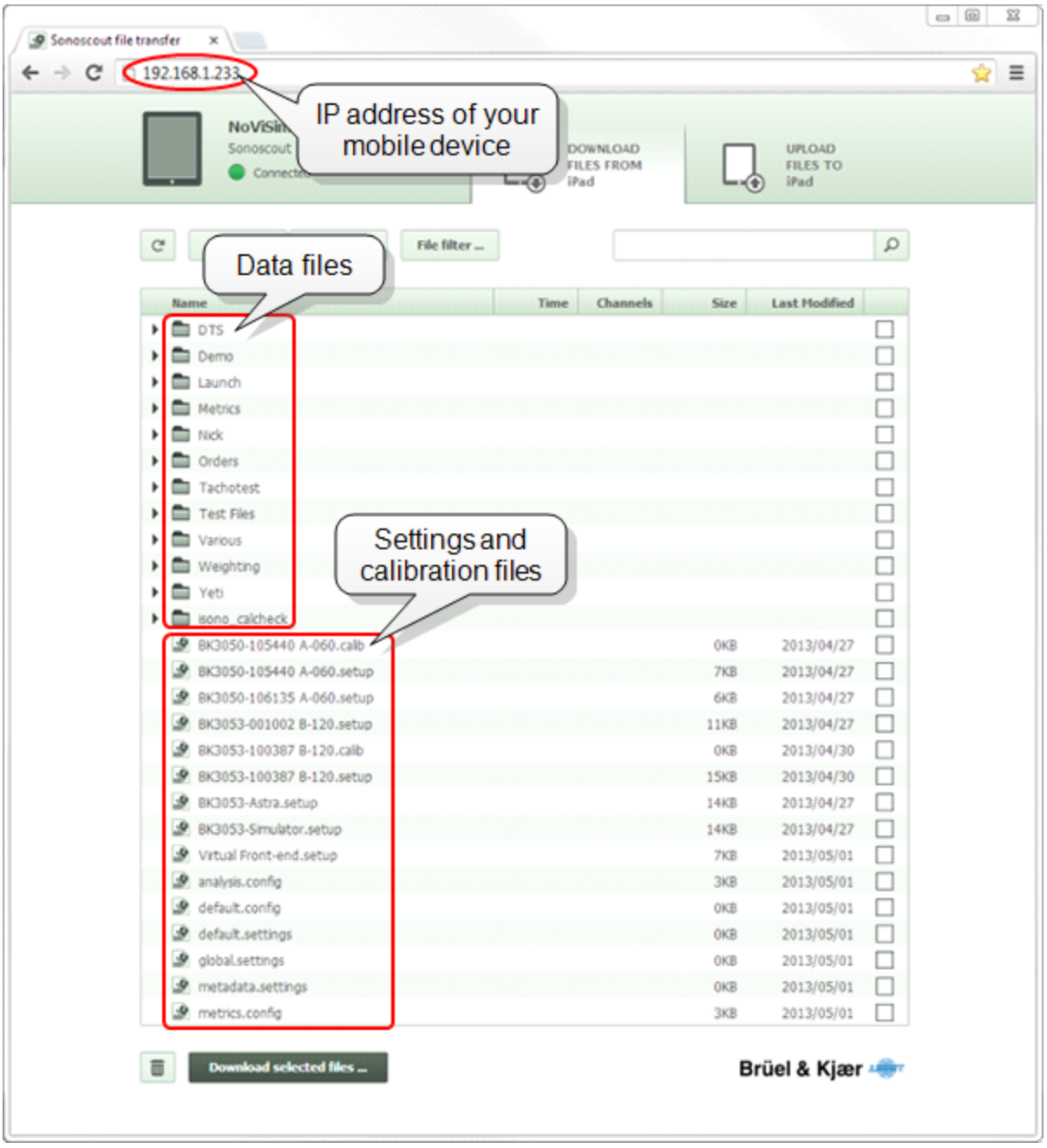
There are various methods for copying files to/from your mobile device and to/from your PC, as well as options for deleting them, these are described below.

Copying Files From your Mobile Device to Your PC

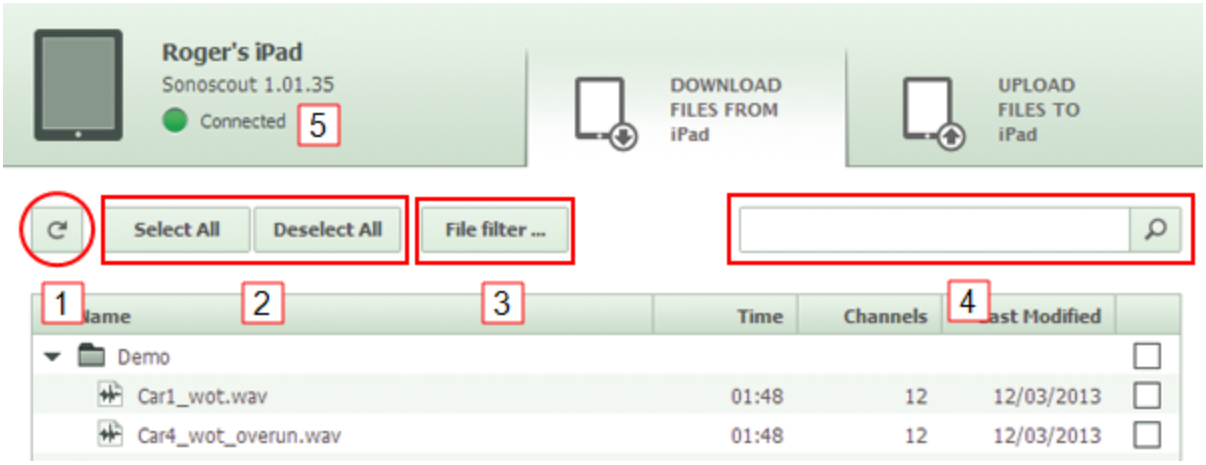
The preferred method for transferring files is to use the Sonoscout web page, as it does not require iTunes® to be running, or even installed on your PC. You can use any web browser on your PC to download files from the mobile device, but Google Chrome™ is recommended, since it supports download of several files in one click.
The procedure for using the Sonoscout web page is as follows:

1. Connect the mobile device and your PC to the same router (this could be the Asus Wireless Router in the LAN-XI Module).
2. Make sure that Sonoscout is running on the mobile device.
3. In your browser, enter the IP Address of your mobile device.
   Tap '?' to open the Information (About) Pop-up and read the IP Address from there:

   The Sonoscout web page appears:

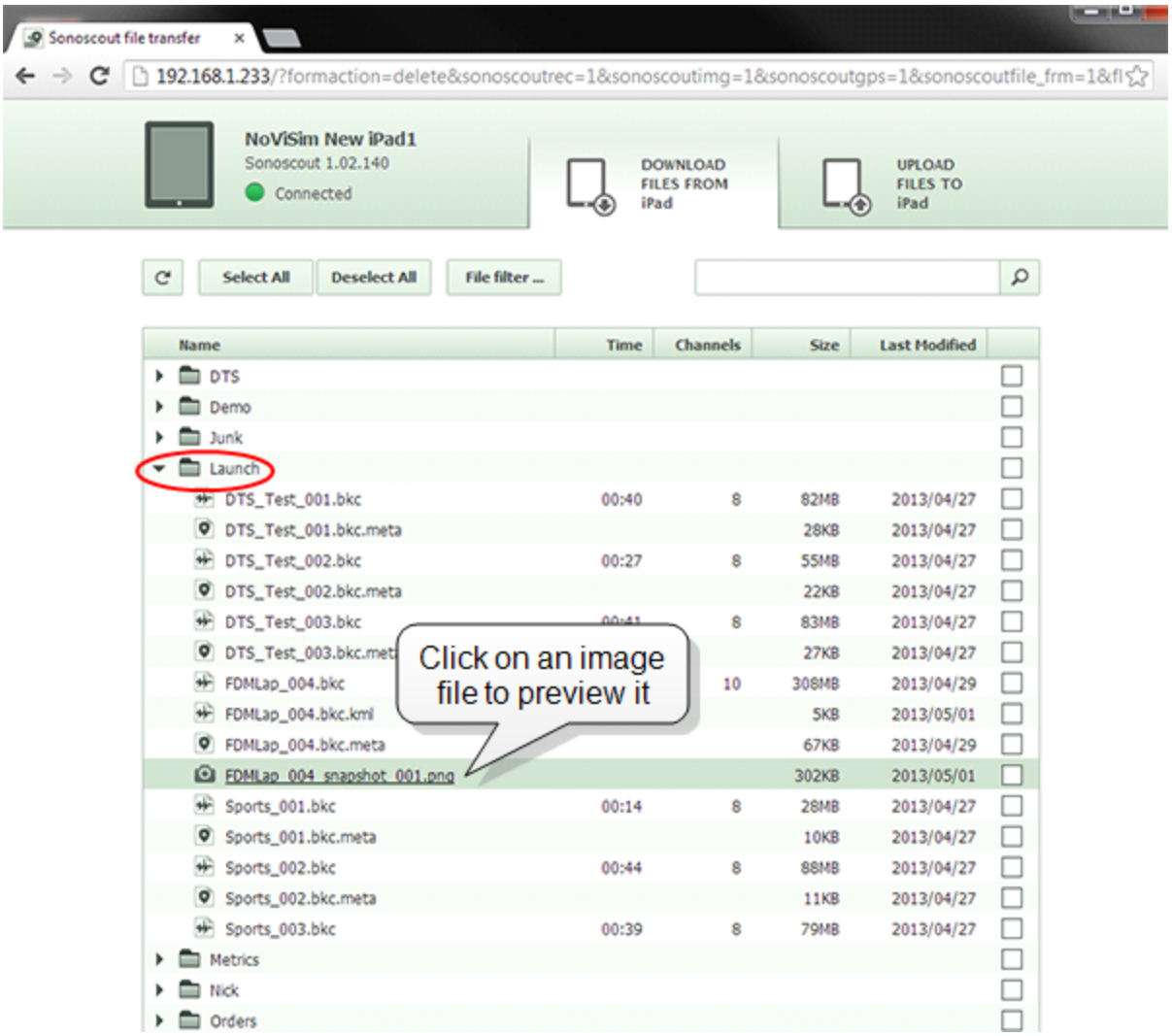


Note: If the web page does not appear, add *:8080* to the IP address.
A search field and extra buttons are provided to help you with file management. These are displayed at the top of the Download screen:

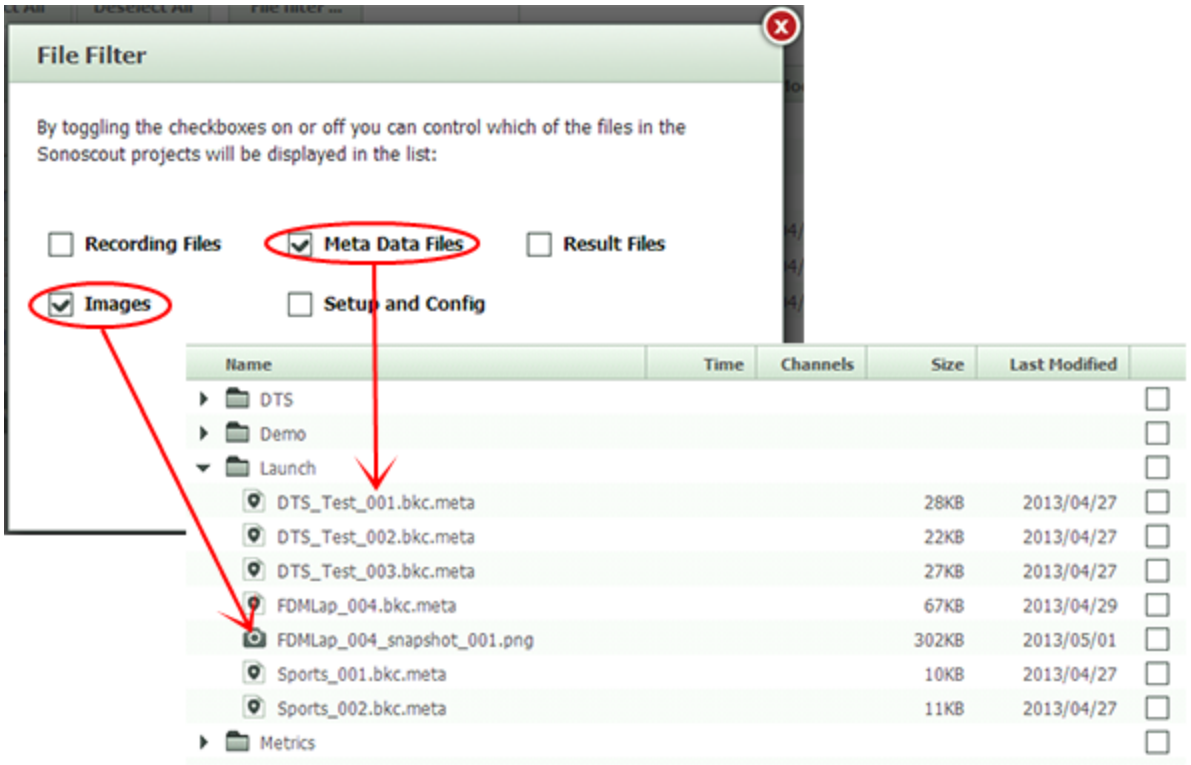


- **Refresh** button [1] - allows you to refresh the display, for example, if you have been using the iPad® during your file management procedure
- **Select All/Deselect All** buttons [2] - these allow you to select or deselect all the files/folders on your mobile device
- **File filter** button [3] - allows you to decide which types of files are shown or hidden in the file/folder list
- Search field [4] - allows you to search in the list of files on your mobile device
- Connected/Disconnected indicator [5] - indicates whether the browser still has connection to the mobile device

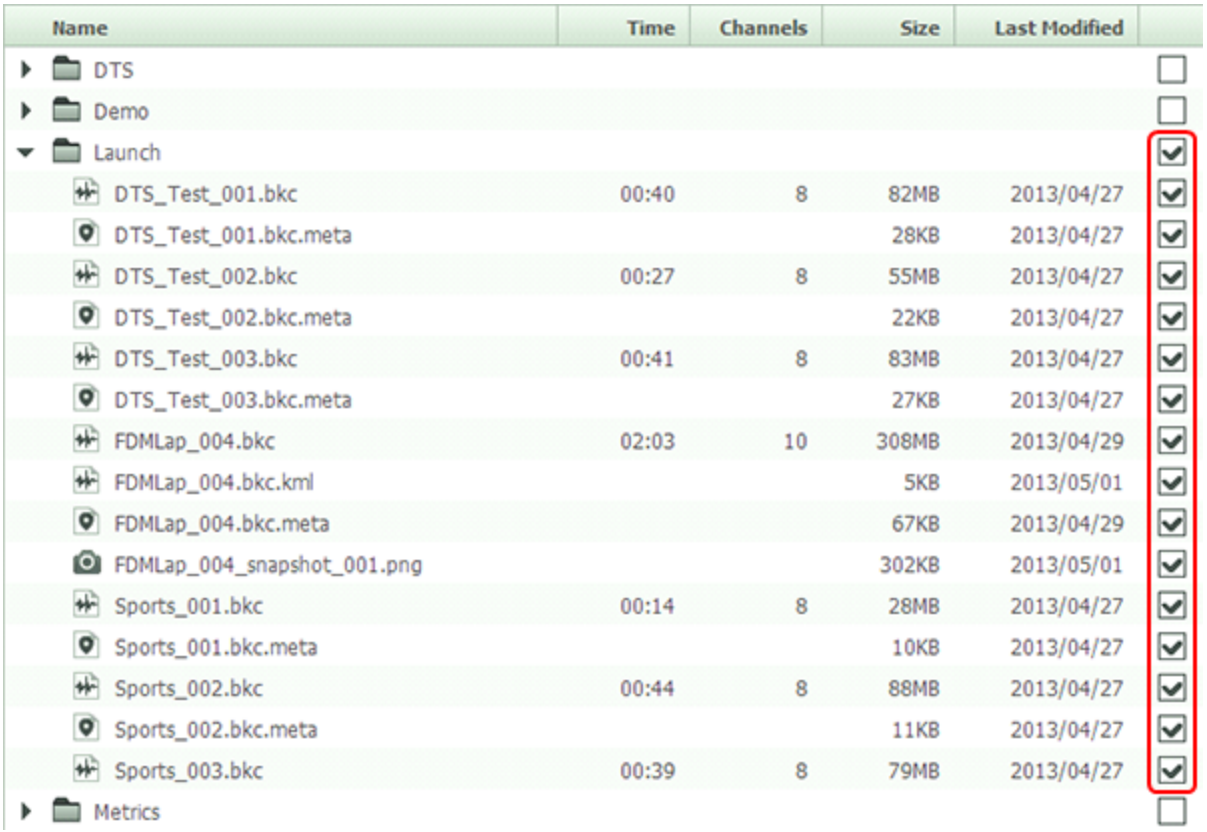
4. Expand the folder containing the data you wish to download:



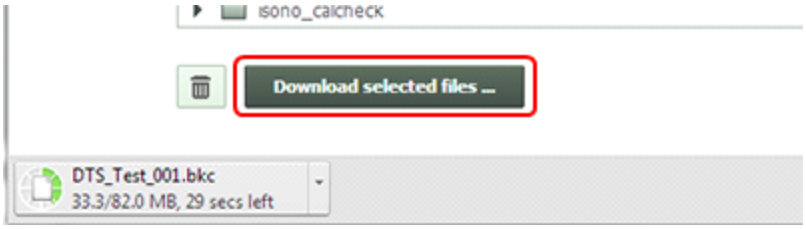
5. Click on **File filter...** to see specific file types:



6. Use the checkboxes to select folder / files to download or delete:



7. Click on the **Download selected files** button and the files/folders are copied to your PC:

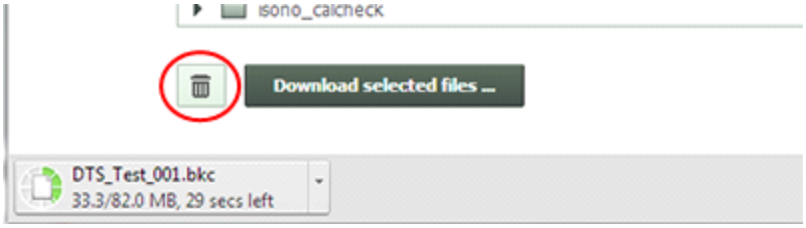


   The files are copied to the Downloads folder in your user area on the PC.

Note 1: Depending on your browser, you may need to confirm the download of each file, or you may just need to confirm that you have chosen to download multiple files and the rest will download automatically.
Note 2: Internet Explorer has *Save* or *Save As* options. The *Save* option automatically saves the files to the *User Account/Download* folder on your PC, the *Save As* option allows you to change the download directory.

Deleting Files from Your Mobile Device

1. Choose the folder, and/or files, that you want to delete by checking the relevant checkboxes on the right.
2. Click the Delete button to delete the selected files:

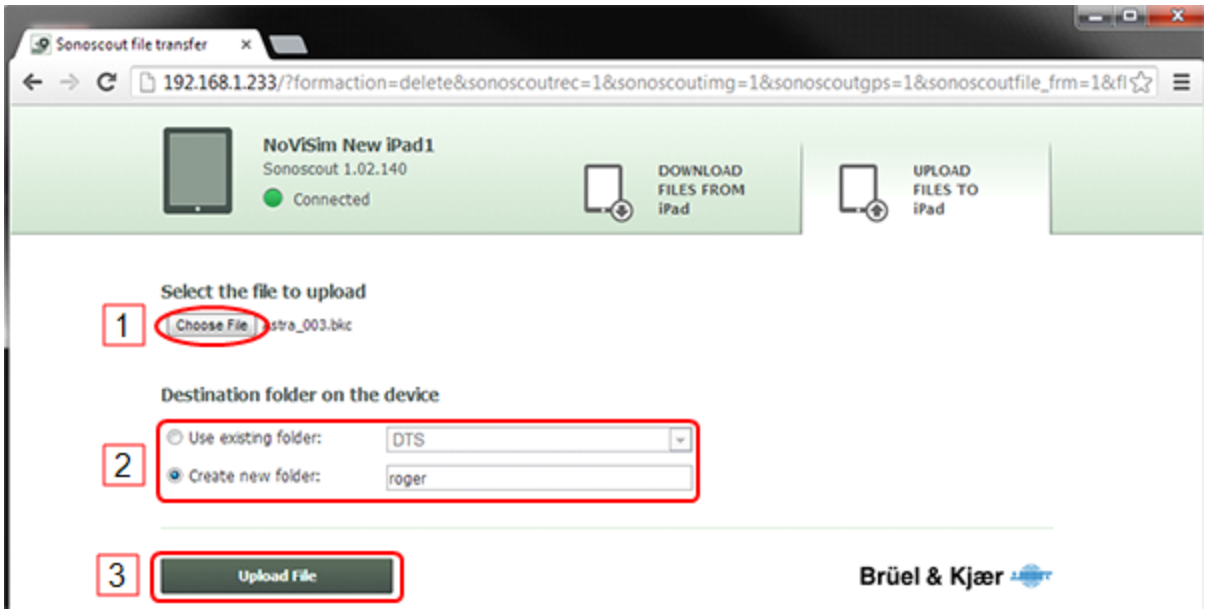


   You need to confirm file deletion in a pop-up that appears.

Copying Files From Your PC to Your Mobile Device (Method 1)

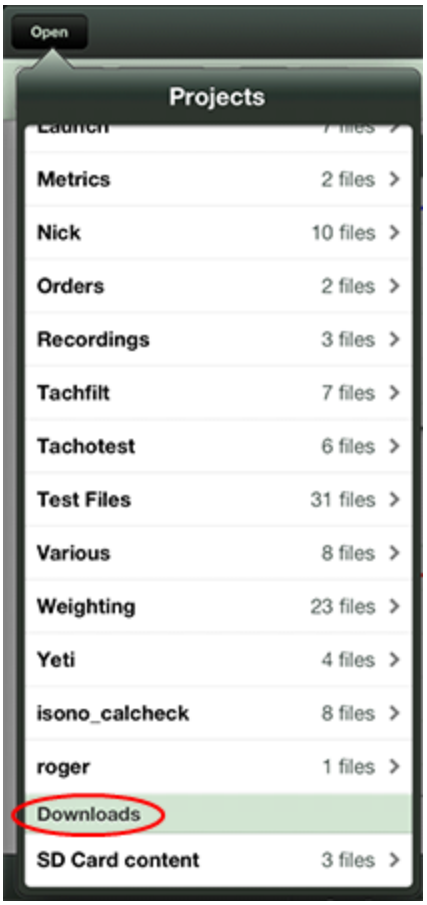
You can use the Sonoscout web page to upload files from your PC, the procedure is as follows:

1. First make sure that Sonoscout is running on the mobile device.
2. Then, in your browser, enter the IP Address of your mobile device.
   Note: If the web page does not appear, add *:8080* to the IP address.
3. Select the file you wish to upload to the mobile device by clicking the **Choose File** button [1]:



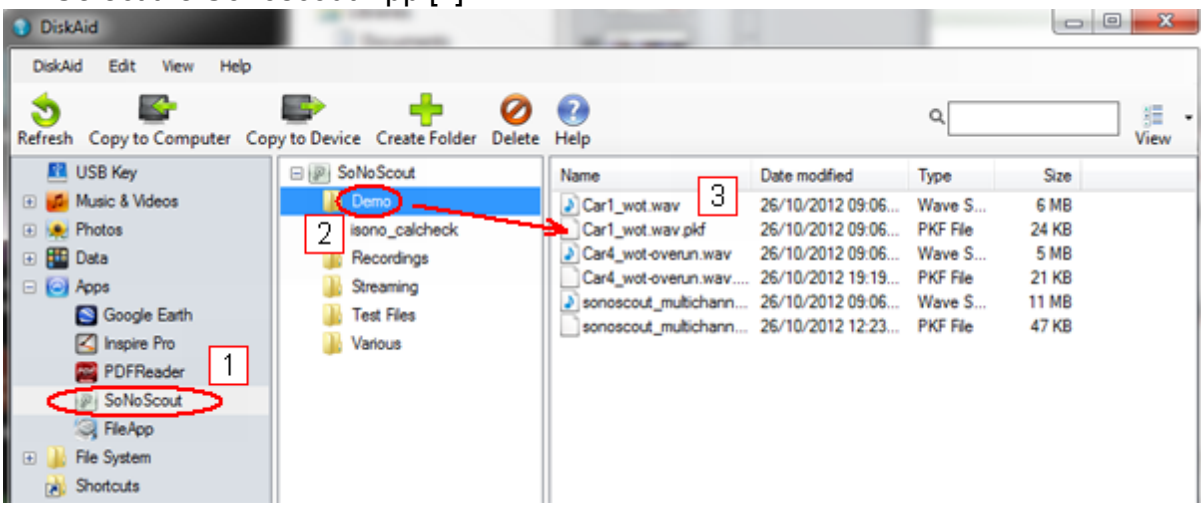
Note: You can only upload one file at a time.

4. Specify an existing or new destination (Project) folder (see [2] above).
5. Click on the **Upload File** button [3] to transfer the file.
6. On the mobile device, the file you have uploaded will appear in the target/selected/specified folder:



Copying Files From Your PC to Your Mobile Device (Method 2)

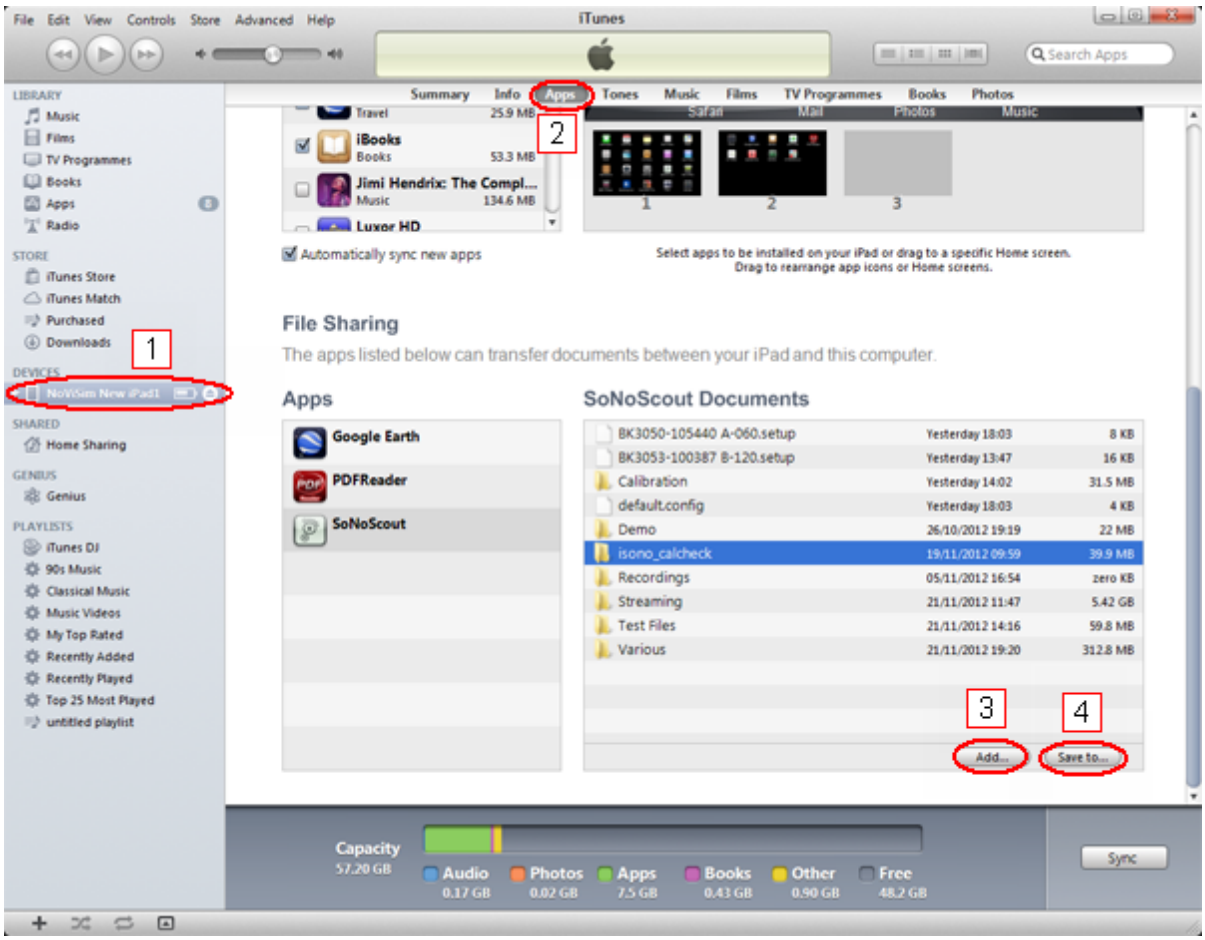
1. Install DiskAid on your PC (download it from http://www.digidna.net/).
2. Connect the mobile device to your PC using the USB connector cable.
3. Start DiskAid .
4. Select the Sonoscout App [1]:



5. Select the folder on your mobile device [2]. (You can also make new folders here.)
6. The list on the right [3] shows the files in that folder on the mobile device. You can drag and drop files **to and from** the PC, or delete them in this window (or alternatively, use the icons at the top of the window).

Using iTunes® to Copy Files (Method 1)

1. In iTunes®, select the connected mobile device [1] and display the Apps [2]:



2. Use the **Add** button [3] to copy files from your mobile device to your PC.
3. Use the **Save to..** button [4] to copy files from your PC to your mobile device.

Using iTunes® to Copy Files to Your PC (Method 2)

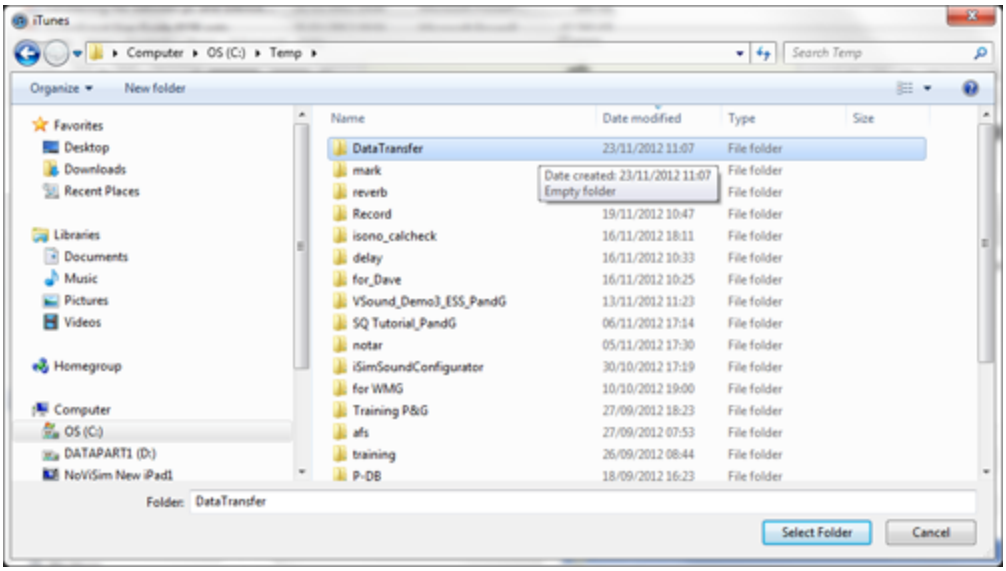
This method has some restrictions, see the note that follows for details.

1. In iTunes®, select the connected mobile device [1] and display the Apps [2] (see previous figure).

2. Select the folder to copy (under *Sonoscout Documents*).

Note: You cannot open the folder and copy individual files from it.

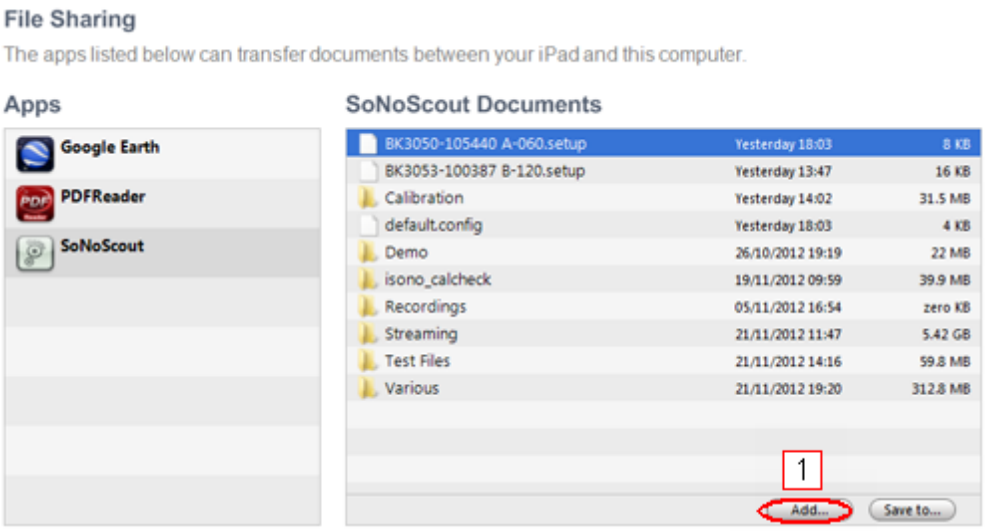
3. Click the **Save to..** button [4].
4. Select an existing file on the PC where the folder should go:



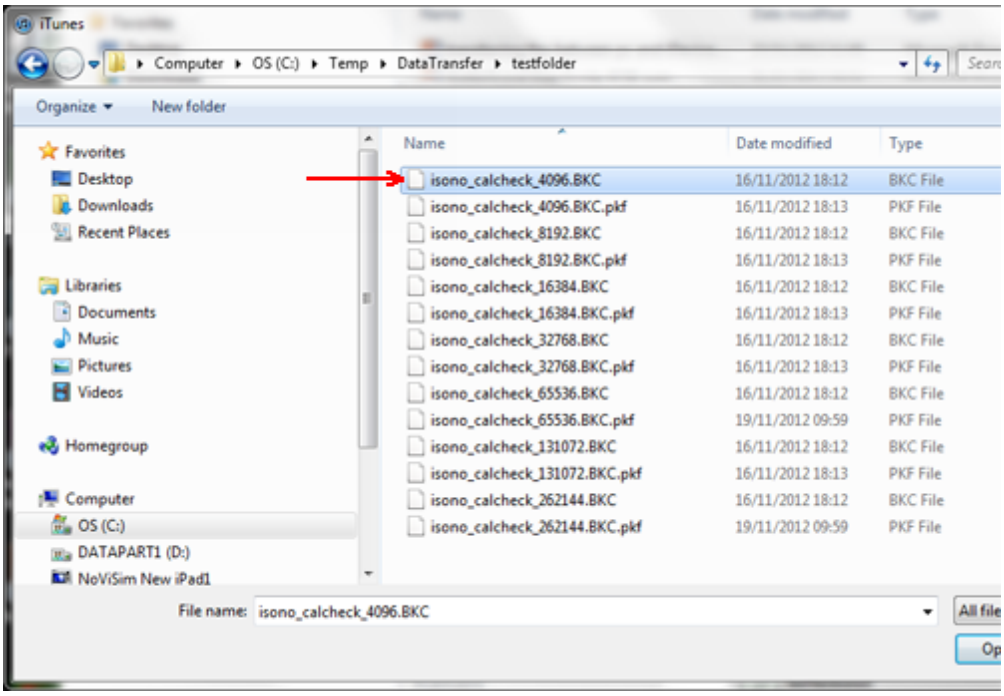
Using iTunes® to Copy Files From Your PC (Method 3)

This method has some restrictions, see the notes that follow for details.

1. Click the **Add** button [1]:

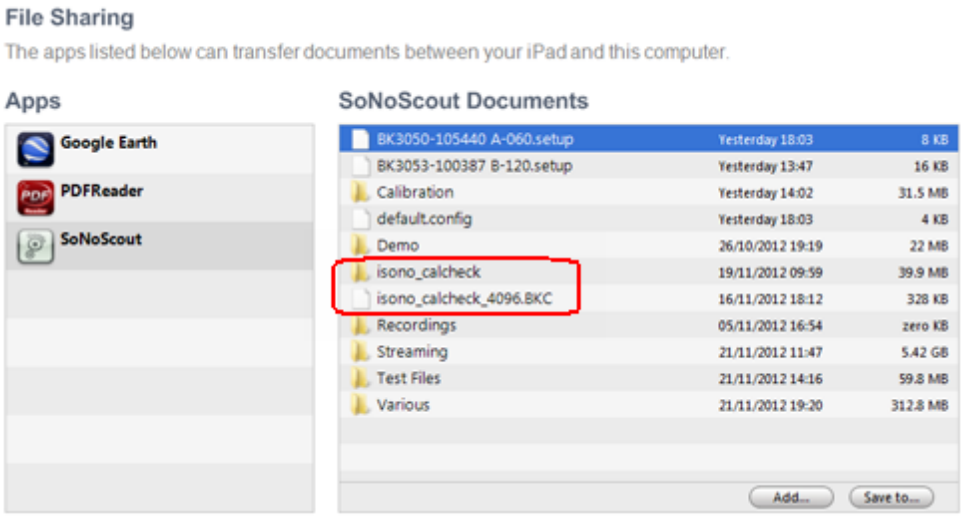

File Sharing
The apps listed below can transfer documents between your iPad and this computer.
Apps
Google Earth
PDFReader
SoNoScout
SoNoScout Documents
BK3050-105440 A-060.setup Yesterday 18:03 8 KB
BK3053-100387 B-120.setup Yesterday 13:47 16 KB
Calibration Yesterday 14:02 31.5 MB
default.config Yesterday 18:03 4 KB
Demo 26/10/2012 19:19 22 MB
isono_calcheck 19/11/2012 09:59 39.9 MB
Recordings 05/11/2012 16:54 zero KB
Streaming 21/11/2012 11:47 5.42 GB
Test Files 21/11/2012 14:16 59.8 MB
Various 21/11/2012 19:20 312.8 MB
1
Add...
Save to...

2. Select an existing file on your PC:



Note: You can only copy files, not folders.

3. The file will be copied to the 'top level'. It is not possible to put the file in an existing folder.


File Sharing
The apps listed below can transfer documents between your iPad and this computer.
Apps
Google Earth
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SoNoScout Documents
BK3050-105440 A-060.setup Yesterday 18:03 8 KB
BK3053-100387 B-120.setup Yesterday 13:47 16 KB
Calibration Yesterday 14:02 31.5 MB
default.config Yesterday 18:03 4 KB
Demo 26/10/2012 19:19 22 MB
isono_calcheck 19/11/2012 09:59 39.9 MB
isono_calcheck_4096.BKC 16/11/2012 18:12 328 KB
Recordings 05/11/2012 16:54 zero KB
Streaming 21/11/2012 11:47 5.42 GB
Test Files 21/11/2012 14:16 59.8 MB
Various 21/11/2012 19:20 312.8 MB
Add...
Save to...

Setting up the Headphones

To be able to use your Brüel & Kjær Binaural Recording Headphones Type 4965, you first need to pair them with your mobile device. Use the following procedure.
Note 1: Before pairing with your mobile device, make sure the battery in the headphones has been fully charged (see the enclosed manufacturer's instructions for charging information).
Note 2: Make sure the headphones are switched off and placed close to the mobile device (approximately 20 cm/ 7 in).

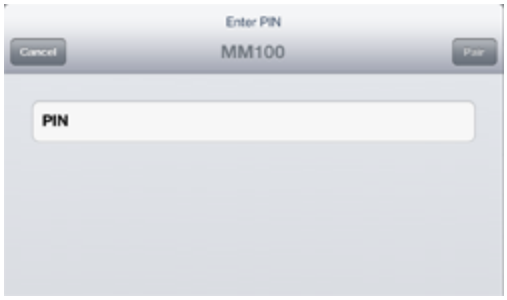
1. On your mobile device, go to *Settings* and select *Bluetooth*:

2. Move the Bluetooth slider to *On*. A list of all the Bluetooth devices that have been discovered will appear.

3. Press and hold the Play/Pause button on your headphones (see figure below) for five seconds. The LED flashes alternately red and blue, indicating that the headphones are in 'pairing mode'.

4. Your mobile device has detected the headphones when *MM100* appears in the Bluetooth Devices list:

5. Tap on *MM100* in the list and enter '0000' in the *PIN* field. Tap on **Pair**.



Connected will be displayed next to *MM100* in the Devices list and the headphones are now ready to use wirelessly:

Setting up a GPS

Note: This task requires GPS capability on your mobile device.

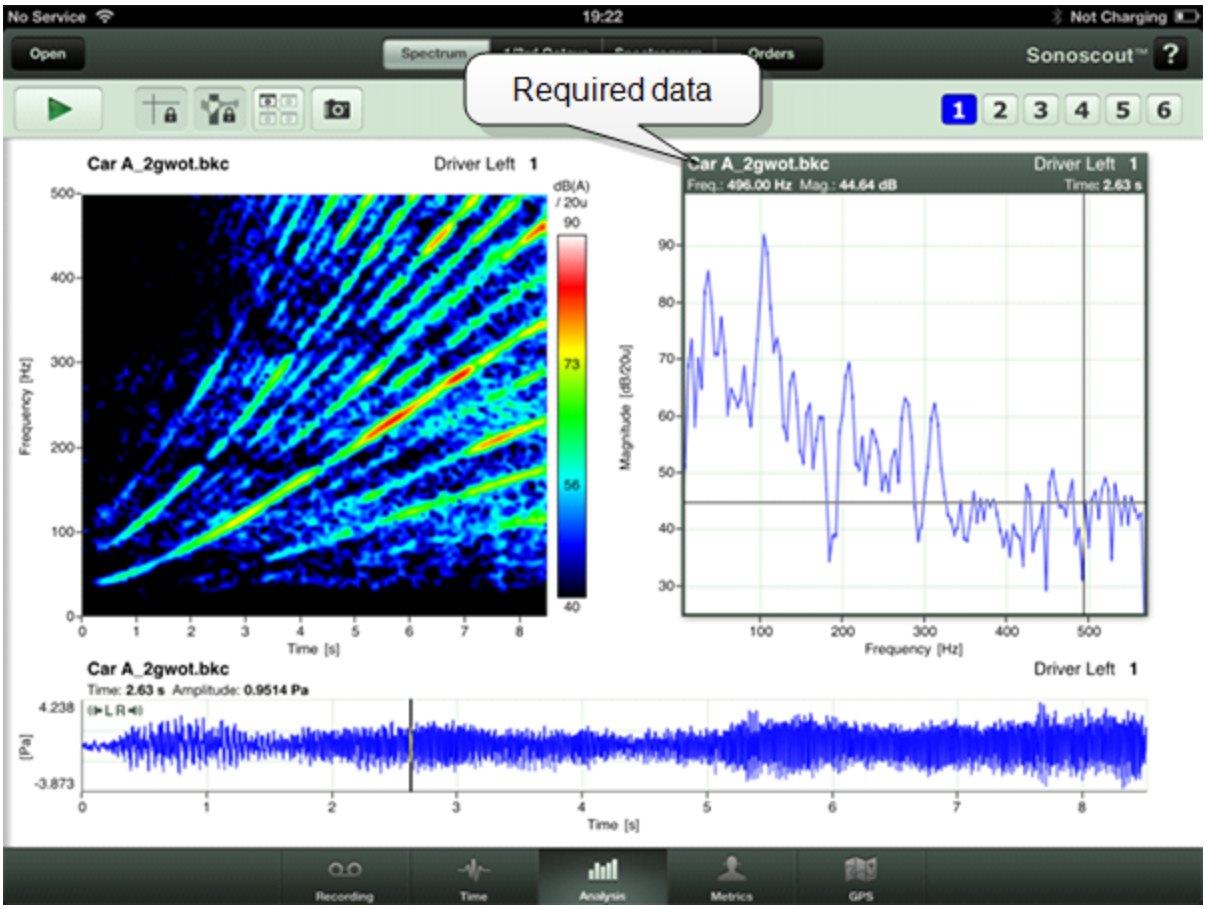
1. Ensure you have enabled the GPS by tapping *Settings* on your mobile device Home screen.

2. Tap *Privacy* and make sure *Location Services* and *Sonoscout* are set to *On*:

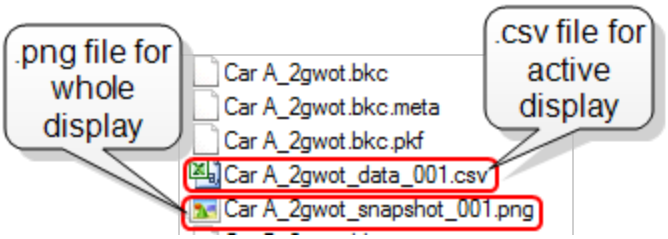
Exporting .csv Files

For all Analysis and Metrics displays (except for Spectrogram) it is possible to export the x-y data to a .csv file:

1. Display the required data:



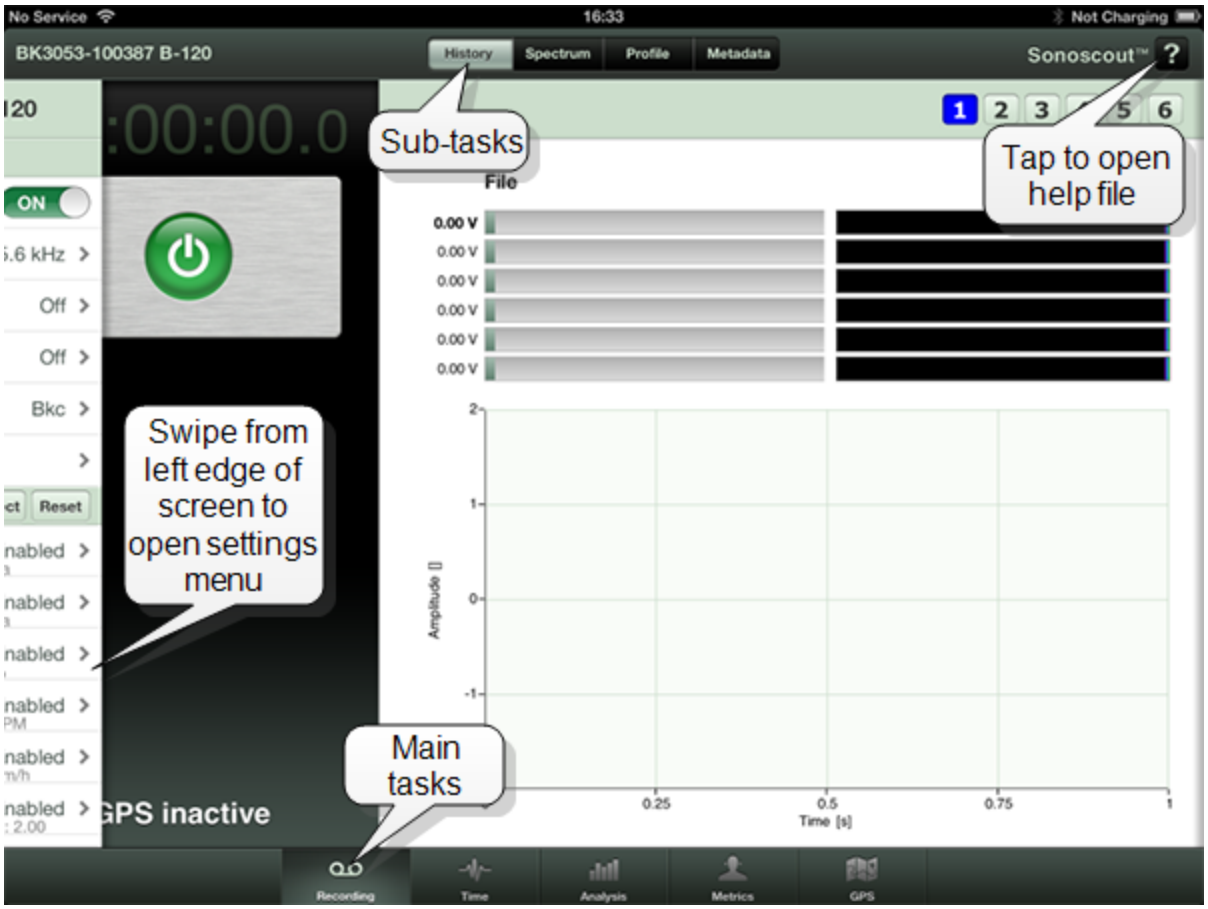
2. Tap the snapshot button.
3. This creates a .png file for the whole display, and a .csv file for the active display. The .csv file has the same base file name as the original time history, appended with an incrementing number:



Reference

This section contains all the reference material you should need.

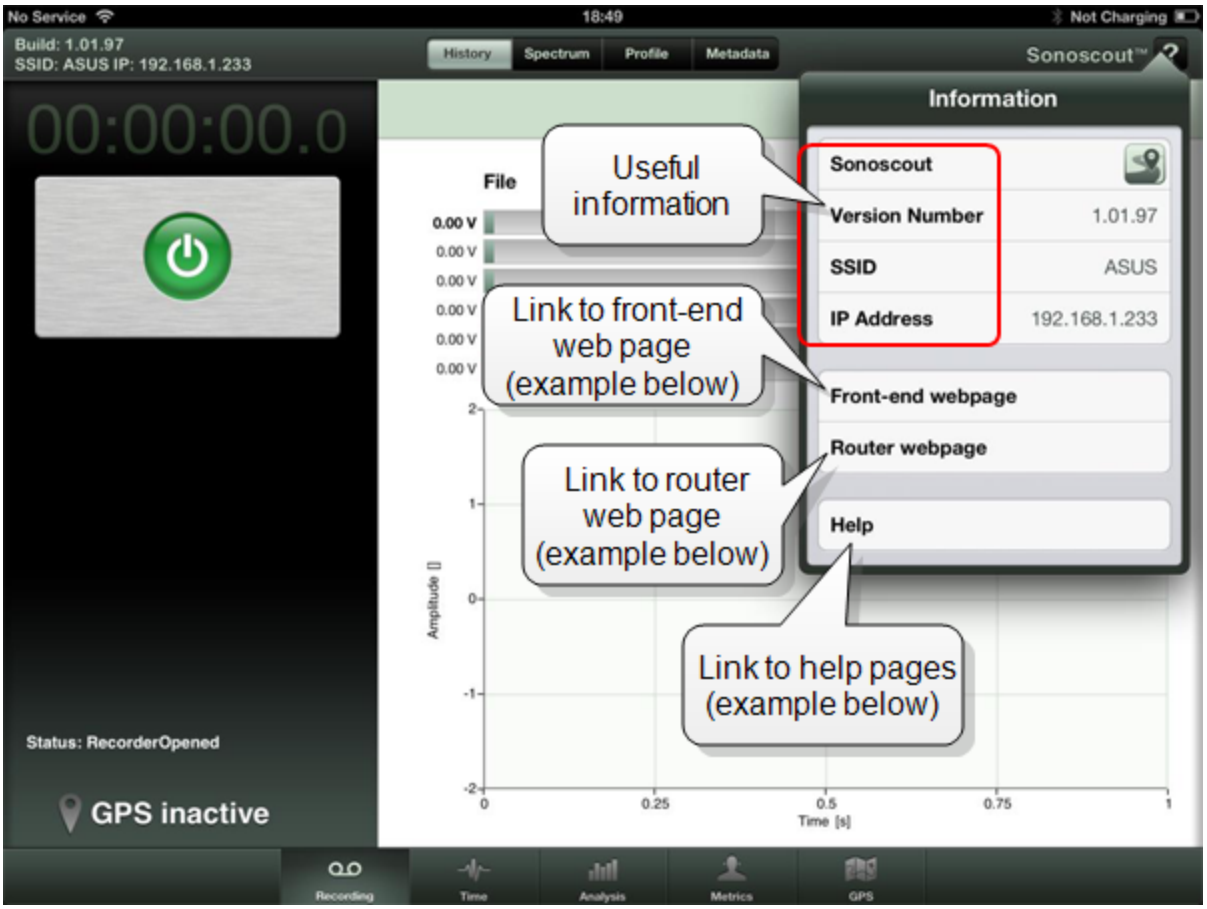
The User Interface



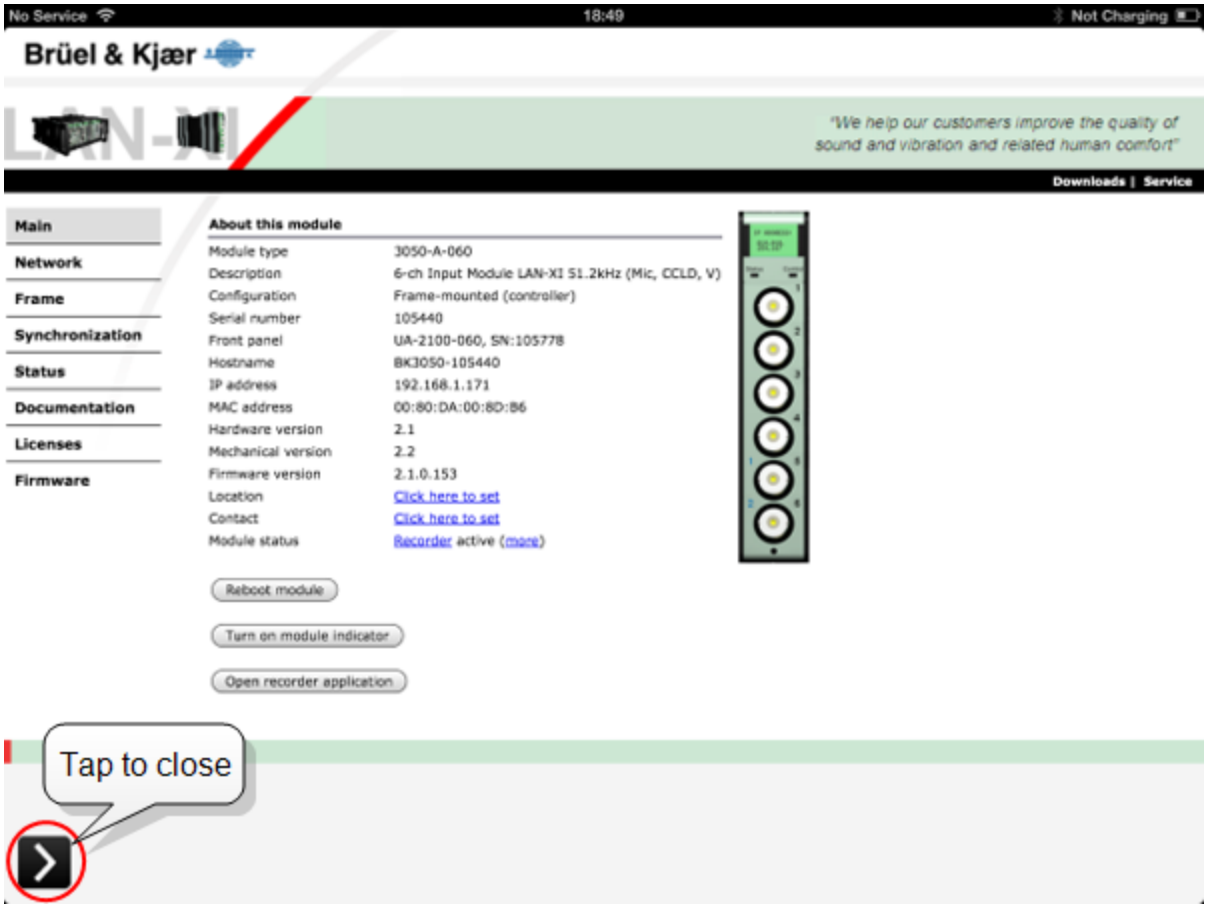
In all tasks, a settings menu is hidden to the left of the display. To open it, swipe from the left of the screen to the right. Place your finger on the frame and swipe to the left to close the menu.
In the Recording Task, a channel table menu is hidden on the right side of the display. Swipe from the right edge of the screen to the left to open.

About Dialogue

The About '?' dialogue contains the following information:

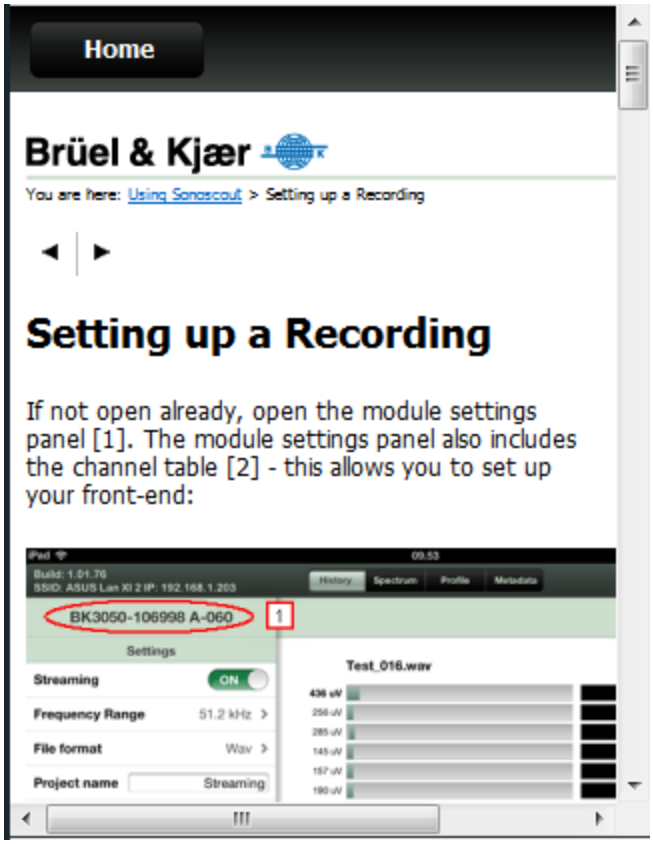

No Service
18:49
Not Charging
Build: 1.01.97
SSID: ASUS IP: 192.168.1.233
History
Spectrum
Profile
Metadata
Sonoscout™
00:00:00.0
Information
Sonoscout
Version Number
1.01.97
SSID
ASUS
IP Address
192.168.1.233
Front-end webpage
Router webpage
Help
File
0.00 V
Useful information
Link to front-end web page (example below)
Link to router web page (example below)
Link to help pages (example below)
Amplitude []
Time [s]
Status: RecorderOpened
GPS inactive
Recording
Time
Analysis
Metrics
GPS

Example Front-end Web Page



Example Router Web Page

Example Help Page



Task Overview

There are five main tasks in Sonoscout:

- Recording
- Time
- Analysis
- Metrics
- GPS

To switch between tasks, tap the icon at the bottom of the screen.
Each task has its own sub-tasks at the top of the screen.
Each sub-task has its own settings menu.

Recording Task

The Recording task provides the interface for set up and running an NVH Recording. It allows you to:

- Select the LAN-XI Module
- Set up the channel table (transducers, tachometers and analogue CAN)
- Calibrate the transducers
- Define the metadata
- Start Pre-recording (to check that all channels are behaving correctly)
- Start recording:
  - View time histories, spectra and profiles (tacho and CAN) in real-time
  - Large digital readout of a selected profile channel to ensure that the correct test condition is achieved
  - GPS is automatically recorded if available on the mobile device, that is, if the device's cellular is enabled
  - Identify important events using markers

Recording States

State 1

When you switch on the hardware, it goes into "Standby" mode. There is no streaming of data from the Front-end.

State 2

Data streaming starts when you switch on the Sonoscout app. The system is in "pre-recording" mode, streaming of data from the Front-end has started, but no data is recorded.

State 3

Data recording starts when you tap the Record button in the app. System is in the 'Recording' mode. Enabled channels are being recorded

State 4

Data recording pauses when you tap the Record button in the State 3. System is in the 'Recording paused' mode. Streaming of data from the Front-end is continuing (but is **not** being recorded).

State 5

Data recording stops when you tap the Stop button. System is in the 'Recording stopped' mode. Recorded files are being stored on the device/SD Card, data streaming continues.

State 6

Data streaming stops when you tap the Stop Data Streaming button. System is back in the 'Standby' mode. There is no streaming of data from the Front-end
Note: There must be a connection between your mobile device and Sonoscout hardware to begin data streaming and recording.

Peak Level Meters

You can monitor the peak level meters and time history of each channel using the real-time displays.
The peak level meter bars display the instantaneous and maximum levels for each channel. Full-scale deflection corresponds to the maximum input level. The green color indicates the signal is in the normal range and yellow indicates the signal is in the 'Headroom'. (To help avoid overloads, you can specify a headroom at the upper limit of the dynamic range, so signals which are above this limit are indicated in yellow, or red if overload occurs.)

Level History Display

The level history display is constantly updated. When a recording is complete, the display is fixed until you tap Record/Pause or Stop. The level history uses a range of colours to indicate level, the highest being indicated by red and the lowest by black.

Time Task

The Time task is where you:

- Perform a visual check of all channels in a time history
- Display tacho and CAN Profiles
- Audition any channel, or pairs of channels, as a stereo sound
- Add additional markers whilst listening
- Edit the metadata, for example, add additional comments, apply descriptions to markers, etc.
- Trim to a selected range, for example, if you need to break a long file up into a set of smaller files
- Copy data from the SD Card to the mobile device
- Delete files and folders

Functions Available in Time Task

- Use multi-touch to zoom in/out on the x and y axes
- Use touch and drag to move the time history left/right or up/down
- Double-tap the display to restore to the default display settings
- In the Time display, double-tap on the y-axis to autorange the amplitude
- Tap to play an individual channel or a pair of channels as a stereo sound. It will play the complete file as a continuous loop (with cross-fade at the ends to prevent a click). The data is always resampled to 44.1 kHz whatever the original sampling rate
- Tap on the time display to get a cursor line with the cursored values at the top of the display, this is the Play cursor. Tap to play the time file from that point. Tap to return the Play cursor to its starting position
- Touch and hold your finger on the display to highlight a range from the position of the Play cursor to the point you touched. Tap to play the range as a continuous click-free loop. You can extend the range by touching (and holding) either side of it
- You can switch channels at any time (whilst playing) and the sound will continue to play (click-free) from the position of the play cursor at the instant of switching
- Once selected, each channel button has a different color which remains constant for all the 2D displays (time, frequency, metrics…) for that channel

Analysis Task

Overview

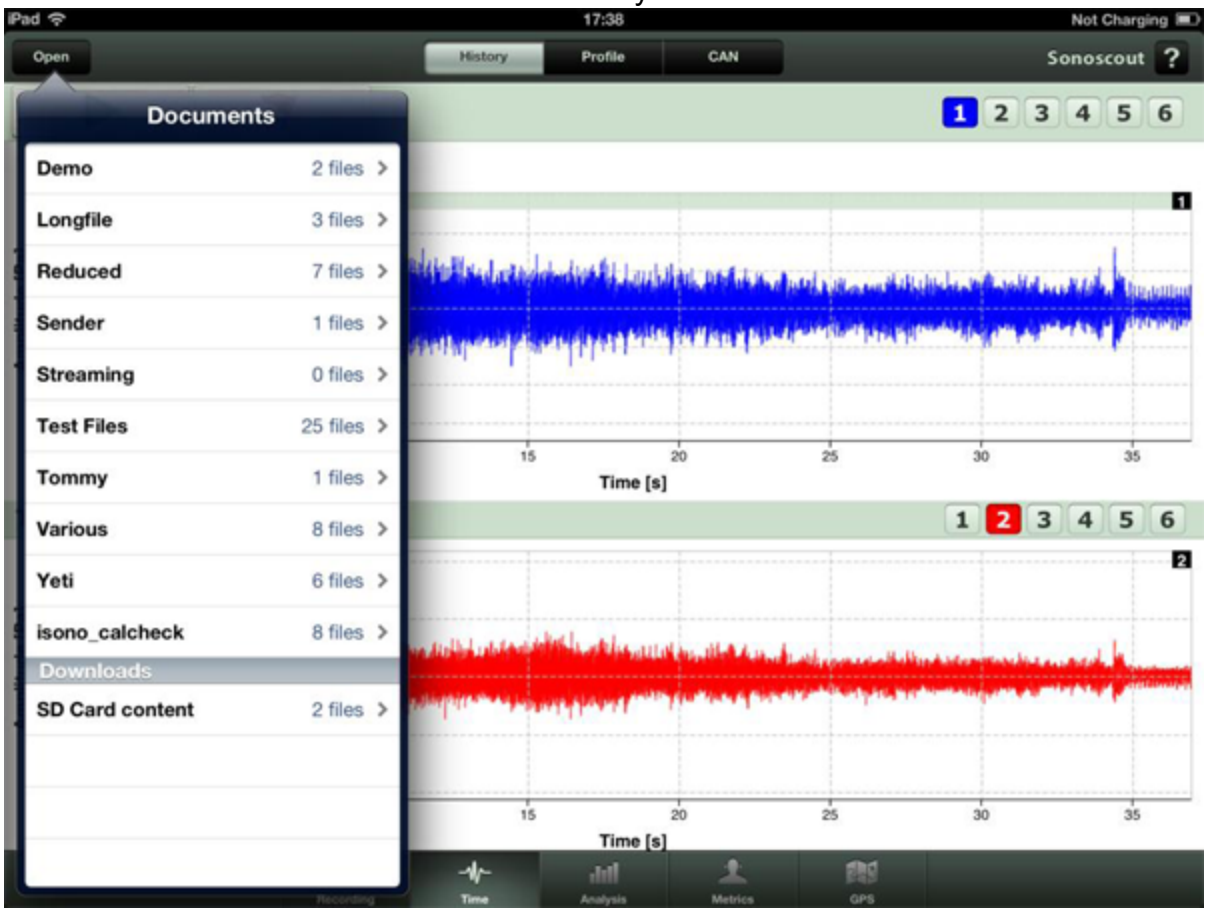
This is a very flexible task for calculating and displaying frequency spectra.
The main features are:

- Auto-spectrum or PSD
- 1/3-octave Synthesised from FFT
- Real-time or averaged spectra

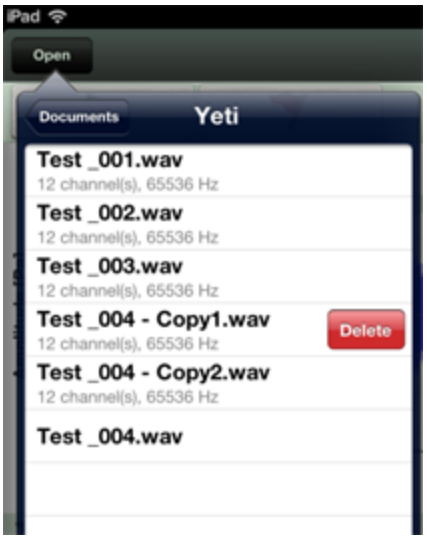
- Spectrogram
- Order Analysis: Overall level plus an Order
- Look and listen at the same time
- Multiple display layouts for comparing:
    - Same type of spectrum for different channels
    - Different types of spectra for the same channel
    - Same channel from different files

Opening Files

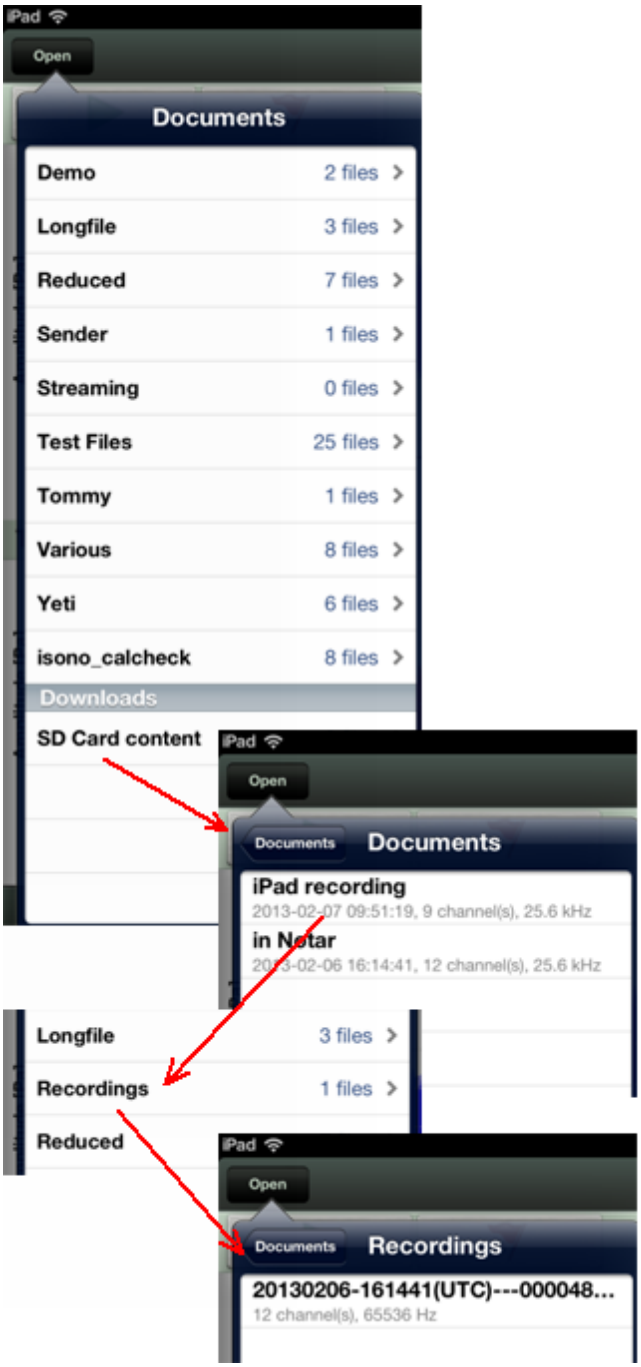
If you use the Streaming option (see Setting up a Recording) the file will be recorded directly onto the mobile device.
In all tasks other than Recording, you can see which folders/files are on the mobile device by tapping Open.
In the following example, the *Demo* folder contains demonstration files included in the installation and all other folders were created by the user:



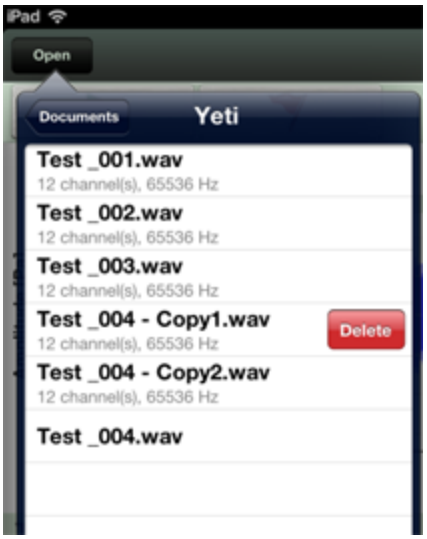
If you switch to the Time task as soon as you have stopped recording a file, the last file you recorded will automatically be open ready to play.
If you touch, hold and slide your finger to the left on a filename a **Delete** button appears which allows you to permanently remove files from the mobile device:



If you did not use the Streaming option the file you just recorded will be on the SD Card. You can see which files are on the SD Card by tapping *SD Card Content*. This opens a list of all files on the SD Card. If you tap one of the filenames this file will be downloaded to the mobile device and stored in the *Recordings* folder:



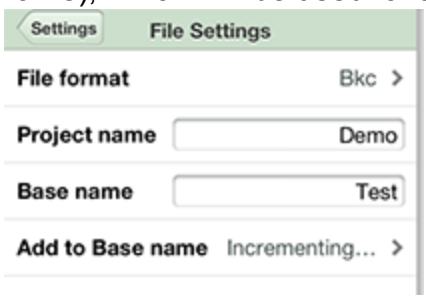
A progress bar is displayed during file transfer.
If you touch, hold and slide your finger to the left on a filename a **Delete** button appears which allows you to permanently remove files from the SD Card.


iPad
Open
Documents
Yeti
Test _001.wav
12 channel(s), 65536 Hz
Test _002.wav
12 channel(s), 65536 Hz
Test _003.wav
12 channel(s), 65536 Hz
Test _004 - Copy1.wav
12 channel(s), 65536 Hz
Delete
Test _004 - Copy2.wav
12 channel(s), 65536 Hz
Test _004.wav

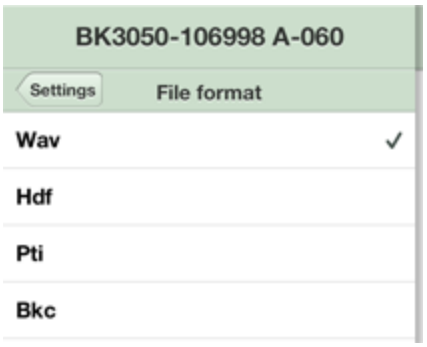
File and Folder Names

Use *File Settings* to set up the file type and file names for recorded time histories:

You can enter a *Project Name* (that is, the name of the folder where the file will be saved) and a *Base name*(a base file name), which will be used for all recorded files:

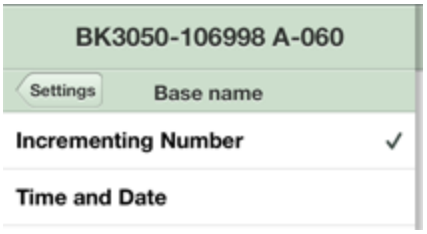


Sonoscout can record files directly in one of four formats:



- *wav*: Wave file (default)
- *hdf*: Hierarchical data format
- *pti*: PULSE Time file
- *bkc*: Brüel & Kjær common file - this is the preferred format if you intend to process your data in PULSE™ Reflex. With the exception of the GPS coordinates, all the metadata created in Sonoscout is stored directly in the .bkc file and is available to you in PULSE™ Reflex.

Simply tap the format you require from the list that appears.
You can choose whether to append the Date/Time or an Incrementing number to the Base file name. So in this example the first recorded file would be called *Test_001.bkc* and be located in the folder called *Demo*:



Created Files

Each recording you make generates a set of files with the same base name. For example, if you use a base name called 'Sono', the filenames will be:

- *Sono_001.bkc*
- *Sono_001.meta* – contains all the metadata plus the GPS coordinates
- *Sono_001.pkf* – file containing the peak history of all channels. It significantly speeds up the time taken to display long time histories. If it is missing for some reason, it will be recalculated

In addition if you trim a file over a range, the start and end time of the range are appended to the filename, for example:

- *Sono_001_10.724-30.456s.bkc* - together wi th equivalent .meta and .pkf files

If you take a snapshot, an image and .csv file are created where the filename includes the name of the data file:

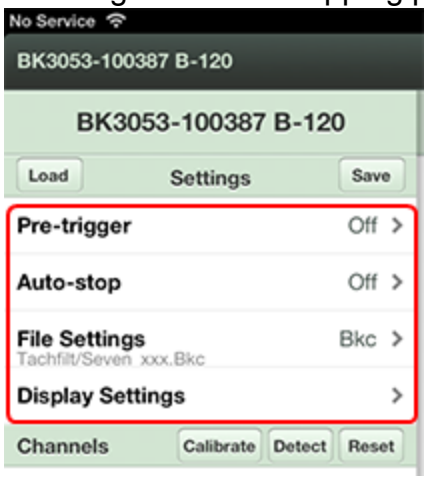
- *Sono_001_snapshot_001.png* and *Sono_001_data_001.csv*

Folders

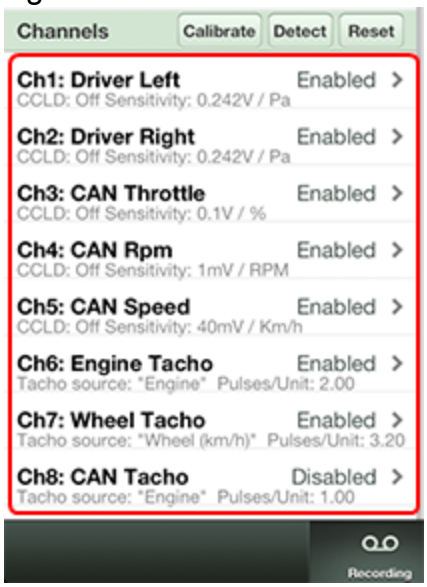
Each set of files is stored in a folder (called a Project in the app). All folders are at the same level, that is, you cannot have folders within folders.

Settings you can Change While Pre-recording

All the following settings can be changed without stopping pre-recording:

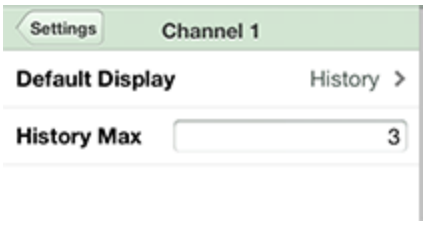


However, in the Channel Settings list:

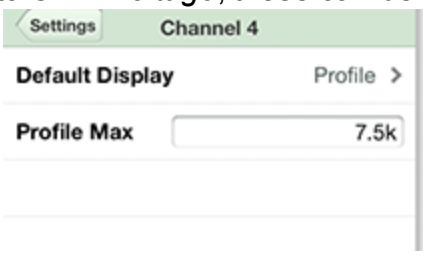


only some of the settings can be changed without stopping pre-recording. These are as follows:

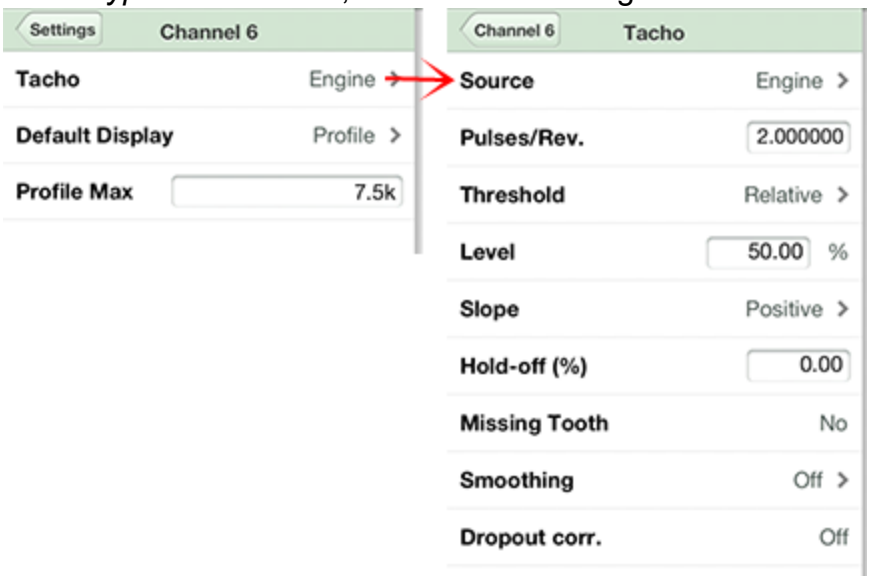
1. With *Channel Type* set to *Signal*, these can be changed:



2. With *Channel Type* set to *CAN Voltage*, these can be changed:

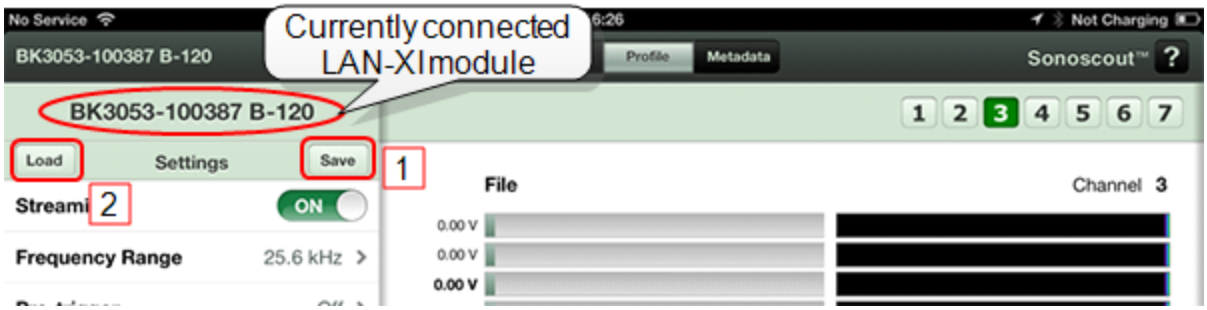


3. With *Channel Type* set to *Tacho*, these can be changed:



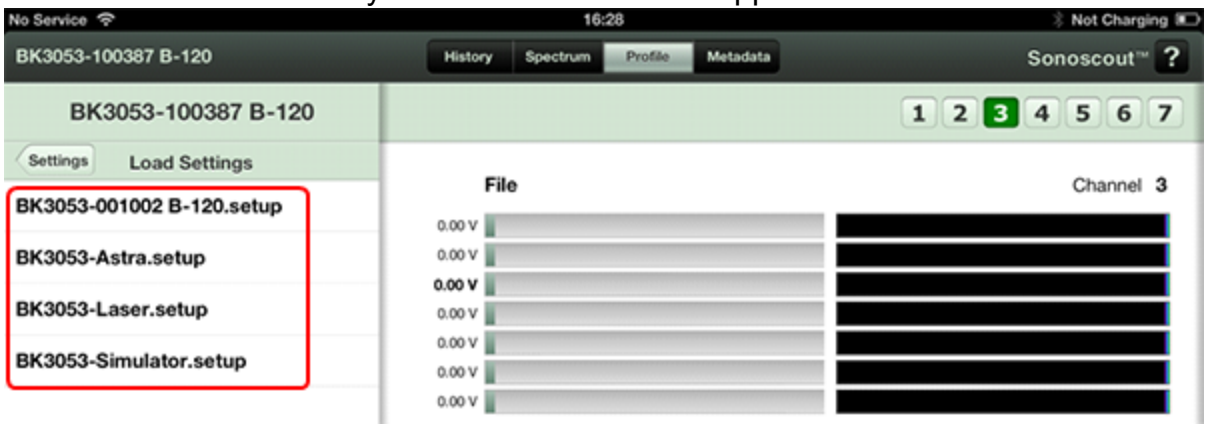
Saving and Loading Recording Setups

1. All the recording setup information is stored on the mobile device in a default file, the name of which is the type and serial number of the currently connected LAN-XI module, for example: *BK3053-100387 B-120.setup*:



2. If you wish to create and keep a number of different setups you can tap the **Save** button (see [1] above) and save the settings to file. The name of the created file always starts with the module type number:

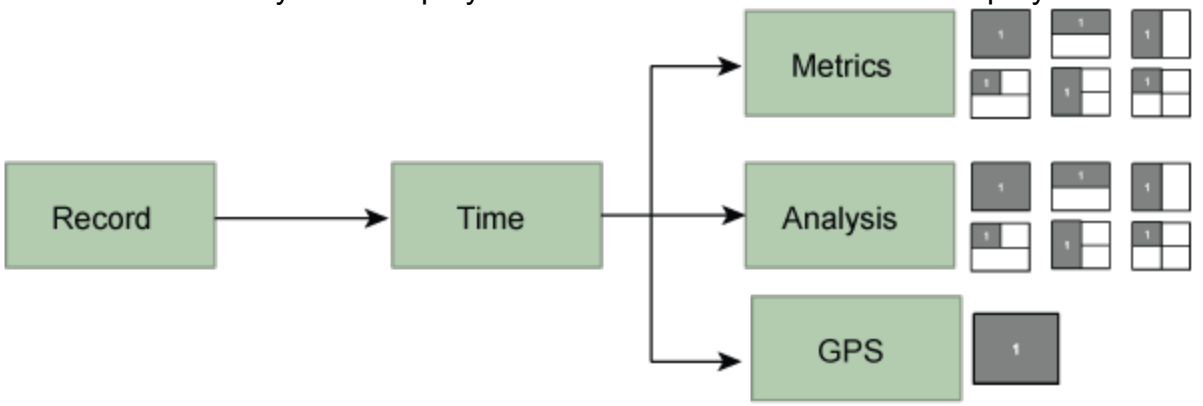
3. You can then use the **Load** button (see [2] above) to load a saved file. (Only those that match the currently connected module will appear in the list:



If you do this it will overwrite the previous default file and the new one will be used when you pre-record or record.
If you do not load a new setup, it will use the existing default file, that is, the settings you used the last time you pre-recorded or recorded.

Data Flow Through the App

If you Record a file it is automatically loaded into the Time displays and into Display 1 of all other tasks and any other display which contains the same file as Display 1:

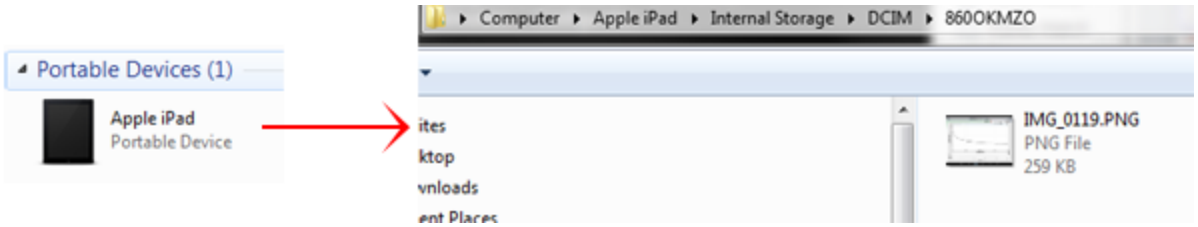


If you open a file in any task it is automatically loaded into the Time displays and into Display 1 of all other tasks and any other display which contains the same file as Display 1. Using this simple logic you can:

- Update all displays simultaneously, for example, if you want to compare different channels from the same file
- Only update Display 1, for example, if you want to compare new data with previous data

Taking Screenshots

If you want to take a screenshot on the mobile device, tap the **Home** button and **Power** button simultaneously.
This creates an image file on the internal storage of the mobile device (for example on an iPad®, it will be stored in under *Photos*).
To copy it onto your PC, simply connect the mobile device to your PC using the USB adaptor cable, open the folder containing the images and copy/paste them as required.:



There is no need to use iTunes® for this process.

Settings Files

The following settings files are used in Sonoscout:

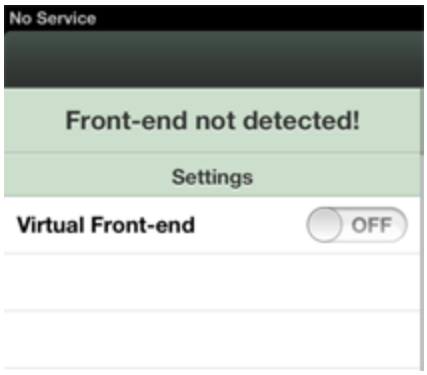
- *BK3053-100387 B-120.setup* - this contains all the settings used in the Recording task
- *BK3053-100387 B-120.calib* - this contains the gain factor for all TEDS transducers calibrated with the system and the sensitivity and gain factor for all manually-defined and calibrated transducers
- *global.settings* - contains the following settings:
  - Calibrator Configurations (for Standard and Custom calibrators)
  - Recording Configurations (for example, File name and Format, Streaming on/off, etc)
  - Analysis Calculation and Display Settings
  - Metrics Calculation and Display Settings
  - Name of last-opened file
  - Metadata entries
- *Virtual Front-end.setup* - default settings for the Virtual Front-end

Virtual Front-end Mode

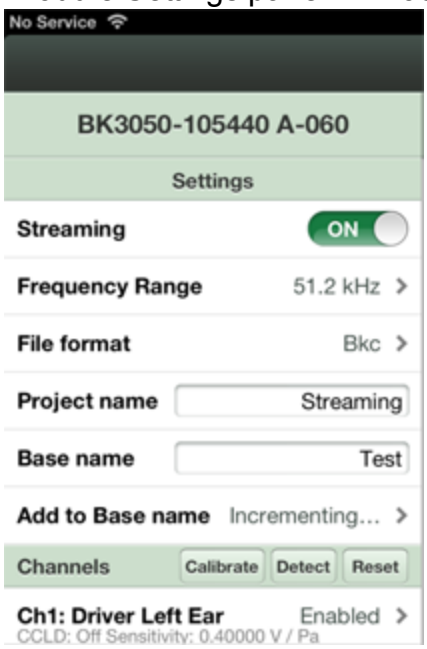
Virtual Front-end Mode (or Demonstration Mode) allows you to test recording functionality without the need for a Sonoscout configuration (installed license plus LAN-XI modules connected). Continue to Running in Virtual Front-end Mode.
If you have installed a license and have the necessary hardware configuration, you can go directly to Using Sonoscout for information on how to use the app.

Running in Virtual Front-end Mode

The purpose of the this mode is to allow you to try out the functionality of the Record task without the need for a license (i.e., no LAN-XI connected).
Virtual Front-end Mode is initially switched off by default, so to enable it you need to be disconnected from the Front-end. You can check this by viewing the Settings panel in the Record task, it should display *Front-end not Detected*:

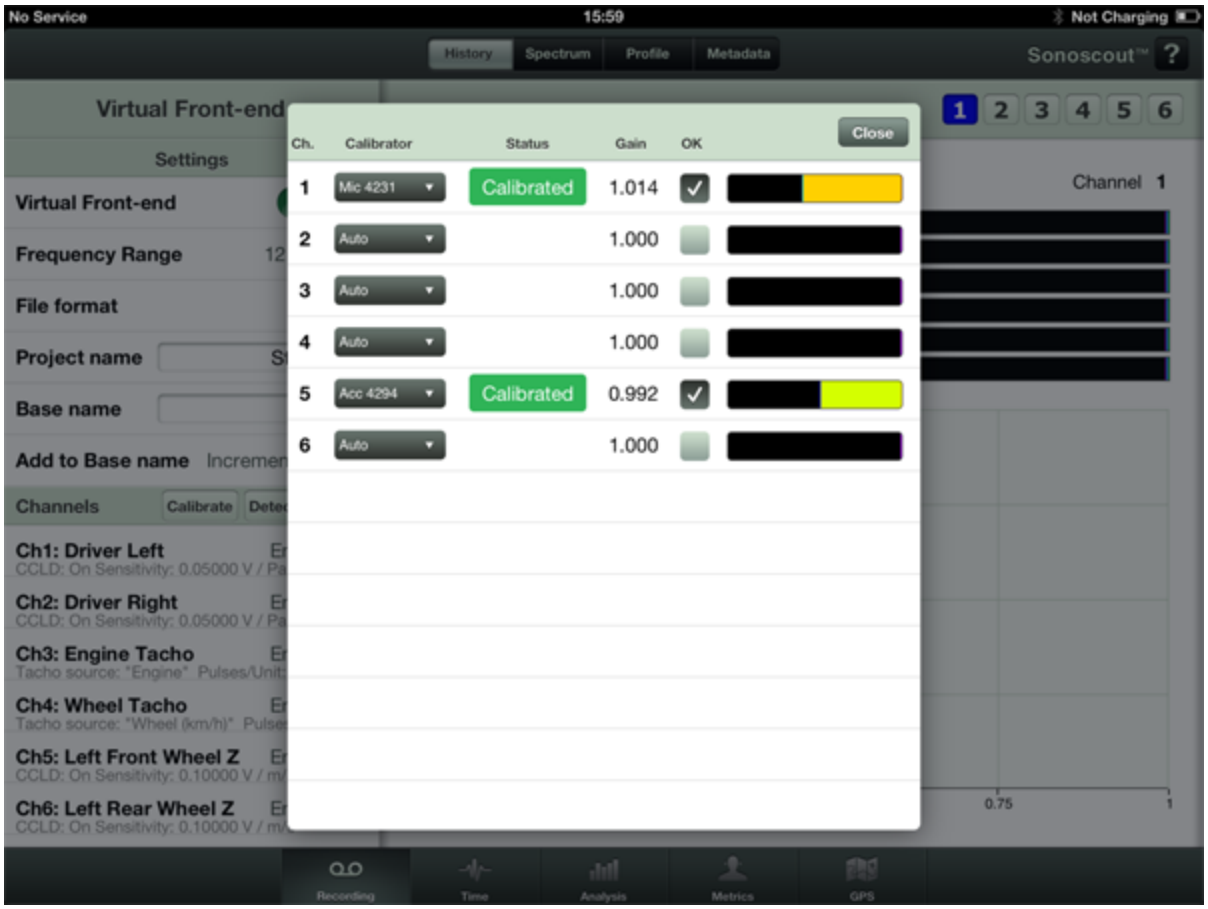


Note: If you are still connected to a Front-end (with a valid license), the Demo Mode setting will not be visible and the module Settings panel will look like this:



In this case, you need to disconnect from the Front-end and check that the Settings panel displays: *Front-end not Detected*.
Set *Virtual Front-end* to *ON*:

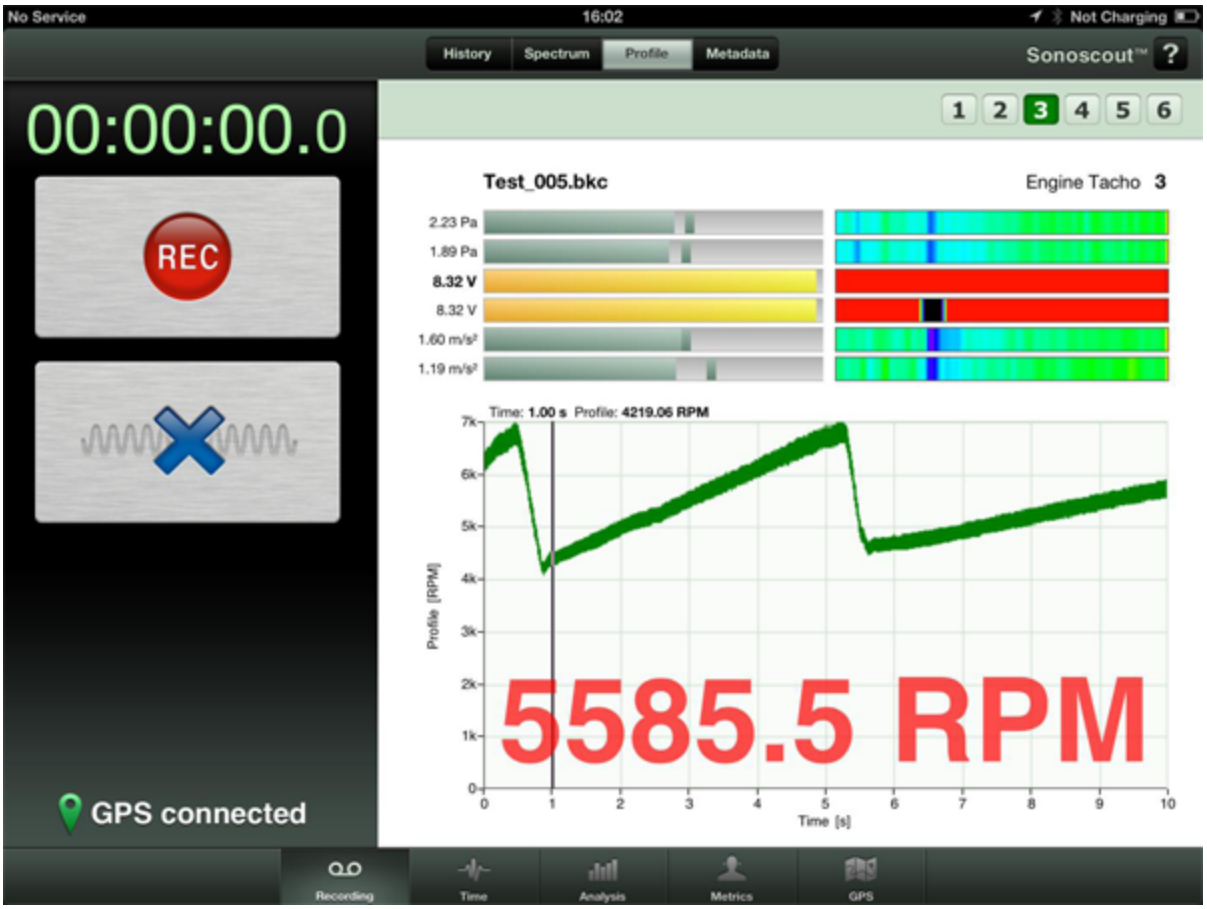
Once in Demo Mode, the displayed Front-end settings are those related to the 'dummy' file, which is installed with the app and emulates a real-time recording.
You can view all the settings but you cannot change any of them. You can, however, set up your own folder and file names (as required).
You can also tap the **Calibrate** button to view the calibration process:



You are now ready to start a recording.
All the standard functionality works, including:

- Pre-recording
- Peak level meters
- Real-time display
- Recording to a file in the format of your choice
- Markers
- GPS (records 'live' data)

The example below shows Pre-recording of a tacho channel in the Demo Mode:



The only difference is that the signals are streamed from a file rather than from a LAN-XI Front-end. Once you have recorded a file you can open and analyse it using all the functionality of the app.

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